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# Yorkshire Naturalists' Union.

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## President :

A. A. PEARSON, F.L.S., Hindhead.

## Hon Treasurer :

S. D. PERSY FISHER, Sackville Street, Leeds.

## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

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## The 466th Meeting

WILL BE

## A FORAY

for the Study of Micro-Fungi

TO BE HELD AT

# Thornton-le-Dale

ON

April 26th—April 29th, 1946

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*Chairman :* Mr. W. D. HINCKS, M.P.S., F.R.E.S., 46 Gipton Wood Avenue, Leeds.

*Recorders :* Dr. J. GRAINGER, West of Scotland Agricultural College, by Ayr ; Mr. W. G. BRAMLEY, Pallathorpe, Bolton Percy, York.

*Secretary :* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Miss Maidment, Warrington House, Thornton-le-Dale, Pickering.

Terms 10/6 a day, but a small extra charge may be made for single rooms.

**LEADER.**—Mr. E. W. Mason, M.A., Imperial Mycological Institute, will act as Scientific Leader for the Meeting.

**LOCAL LEADER.**—Mr. R. M. Garnett, Whitbygate, Thornton-le-Dale, will act as Local Leader.

**WORKROOM.**—A workroom, fitted with electricity, is available at Headquarters.

**MICROSCOPES.**—Will members please bring their own, if at all possible. Mr. Hincks has promised to loan a dissecting microscope, and one or two microscopes may be borrowed from the Grammar School, Pickering. Please bring slides and needles.

**PERMISSION.**—Mr. Lloyd Graeme, Kingthorpe Hall, has given permission for collecting material in Kingthorpe Woods.

**MAPS.**—Sheet 22, One-inch Ordnance.

**MEETING.**—A meeting for discussion about specimens and other business will be held at 4 p.m. on Sunday, April 28th.

**VISITORS.**—It is hoped that several experts from the British Mycological Society will be present. This meeting offers a unique opportunity for anyone interested in the smaller fungi to enhance their knowledge. Prospective members of the Mycological Committee will be welcomed. Any further particulars from Miss J. Grainger, Wilshaw, Meltham.

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Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## Divisional Secretary :

C. W. MASON, 15 Park Avenue, Hull.

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## The 467th Meeting

WILL BE HELD AT

# SPURN

ON

## Whit Week-end June, 8th-10th, 1946

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**HEADQUARTERS.**—White Horse Inn, Easington (Prop. : Mr. S. Taylor)  
Members should write and book rooms early.

The Café at Kilnsea (Prop. : Miss Leonard) will provide tea, lunch or dinner.  
Members will please notify Miss Leonard should they desire to be served with any of these ; owing to rationing difficulties it is necessary that she should know in good time.

**TRAVEL FACILITIES.**—Buses leave Baker Street, Hull, for Easington and Kilnsea :

### FROM HULL—

Weekdays.	Sunday.
8-35 a.m.	11-5 a.m.
12-5 p.m.	9-20 p.m.
12-35 p.m. (Sat.)	
2-20 p.m. (Sat.)	
4-35 p.m. (Sat.)	
5-35 p.m.	
9-0 p.m. (Sat.)	

### FROM EASINGTON—

Weekdays.	Sunday.
6-20 a.m.	9-30 a.m.
9-10 a.m.	8-0 p.m.
10-30 a.m.	
12-48 p.m. (Sat.)	
4-0 p.m.	
7-30 p.m. (Sat.)	

*Note.*—Bus leaves Kilnsea half an hour earlier.

**Routes.**—Saturday : Messrs. Ainsworth and Lord will conduct the party from Easington on the arrival of the 8-35 a.m. bus to Kilnsea by the same bus for Spurn.

Sunday : Mr. C. F. Procter will conduct the party to the Salt Marshes on the Welwick shore, leaving Headquarters at 10 a.m.

Monday : Messrs. Ainsworth and Lord will conduct the party from Easington along the shore to Spurn, leaving Headquarters at 10 a.m.

The Geological Section will visit the Dimlington Cliffs under the guidance of W. S. Bisat, M.Sc., F.G.S., from Headquarters each day at 10 a.m.

Tides : High tide on 8th June, 11-7 a.m., 11-12 p.m.

**PERMISSION.**—The meeting has been made possible by kind permission of the War Office Department.

**GEOLOGY.**—W. S. Bisat, M.Sc., F.G.S., writes : The boulder-clay cliffs at Dimlington a mile north of Easington, are perhaps the finest exposures of glacial tills in England, and are full of erratics from many areas, ranging from Galloway in the north-west to Scandinavia in the north-east, and a fine boulder of Shap granite from the beach may be seen on the roadside between Easington and the sea. Erratics of chalk are abundant in the drab coloured clays of the cliffs and also black flints, whose exact source is unknown. The lowest bed seen under the high ground at Dimlington is a blue clay full of marine shells and Scandinavian erratics. Interglacial moss has also been found in three places in silts just above the Basement Clay. Just south of Easington lane end exposures on the foreshore have shewn that here is a post-glacial channel with estuarine shells and a peat bed. The reddish-brown Purple Clays may be seen in the upper part of the cliff at Dimlington, and this is the southern end of their range. These clays contain less chalk than the Drab Clays beneath them, but much more Liassic and Triassic material. On the beach, Scandinavian erratics such as laurvikite and rhombporphyry are quite common.

**BOTANY.**—Mr. A. K. Wilson writes :. The botany of the Spurn district has been well investigated and in recent years the following have been added to the plants occurring there : *Trifolium striatum* L., *Crepis biennis* L., *Carum Petroselinum* B. and H., *Rhinanthus stenophyllus* Schur., *Campanula rapunculoides* L., *Ruppia maritima* L. and *Carex divisa* Huds.

Species occurring on the sand dunes and sea shore are : *Claytonia perfoliata* Donn., *Eryngium maritimum* L., *Artemisia maritima* L., *Armeria maritima* L., *Calystegia soldanella* Br., *Atriplex littoralis* L., *Atriplex portulacoides* L., *Salicornia herbacea* L., *Suaeda maritima* Dum., *Salsola Kali* L., *Hippophae rhamnoides* L., *Carex arenaria* L., *Phleum arenarium* L., *Ammophila arenaria* Link., and *baltica* Link., *Festuca arundinacea* Schreb., *Festuca rubra* L. var. *arenaria* (Osb.), *Agropyrum jununceum* Beamr., *Elymus arenarius* L.

Other plants having occurred on Kilnsea Warren and area are : *Sisymbrium Thalianum* (L.), *Viola ericetorum*, *Cerastium semidecandrum* L., *Erodium maritima* L. Hir. and *moschata* L. Hir., *Trifolium arvense* L. var. *prostratum*, *Trifolium scabrum* L., *Lotus corniculatus* L. var. *villosa*, *Medicago sativa* L., *Vicia tetrasperma* (L.) Moech., *Vicia lathyroides* L., *Apium graveolens* L., *Galium sylvestre* Bll., *Valerianella olitoria* Poll., *Aster tripolium* L. and var. *discoidens* Reichb., *Erigeron acer* L., *Leontodon hirtus* L., *Blackstonia perfoliata* Huds., *Erythraea centaurium* L., *Cuscuta epithymum* (L.) Murray, *Cuscuta trifolii* Bab., *Lycium chinense* Mill., *Marrubium vulgare* L., *Betula maritima* L., *Orchis pyramidalis* L., *Ophrys apifera* Huds., *Ruppia rostellata* Koch., *Scirpus maritimus* L., *Zostera marina* L., *Hordeum marinum* Huds., *Asplenium Adiantum-nigrum* L., *A. Trichomanes* L. (Easington Church walls). Several old records need confirmation, including *Trifolium filiforme* L.

**ORNITHOLOGY.**—G. H. Ainsworth and J. Lord write : As the time of the meeting is outside the migration season the list of birds appended has been confined to those found breeding there in recent years. Even at this season, however, small parties of Swifts may be seen moving south.

The area covered includes the dykes and marshy ground situated near the old site of the beacon, as well as the peninsula itself.

The list of breeding birds includes Oyster Catcher, Ringed Plover, Redshank, Lapwing, Little Tern, Arctic Tern, Magpie, Shelduck, Stonechat, Wheat-ear, Reed Bunting, Yellow Bunting, Common Bunting, Mallard, and Red Legged Partridge.

The Short Eared Owl has been seen in pairs there in the nesting season, and breeding has been suspected. The Sandwich Tern may also have bred within recent years, as in the case of the Arctic Tern.

A visit to the Lighthouse will reveal that the perches for the migrants are still down. In view of the work done in the past to have these perches put up for the protection of birds from the light it is hoped that the visit may result in the perches being returned.

The bird trap and cottage comprising the Bird Ringing Station under the direction of the Y.N.U., should be found of interest, although little ringing will be possible owing to the time of the year.

**MAMMALIA AND REPTILIA.** Mr. C. F. Procter writes : This area which is abundantly rich in the things that interest nearly every branch of nature study, is sadly deficient in anything of outstanding importance to that section of zoology dealing with the above. On the point itself, frogs, toads and newts are unknown. Except for rabbits, which occur in some abundance, there are no rodents. There are no grass snakes, but the common viviparous lizard—*Lacerta vivipara*—is common from Welwick Corner right up to the end of the point on the Humber side, among the chalk revetments. An occasional fox or hare may be seen on the peninsular, but they are both stragglers.

Easily the most outstanding records are those of occasional whales, seals and porpoises, which at intervals turn up at the seaside or Humber side of the Isthmus. Since the great flood of 1906 when the sea bank broke down and a great deal of the low-lying area between Kilnsea and the North-west end was under water from Sea to Humber, this state of affairs has existed. It would be idle, therefore, to claim an interest in this side of nature study for a fleeting visit.

**ENTOMOLOGY.**—Mr. W. D. Hincks writes : The insect fauna of the Spurn peninsula is one of the most interesting in the county. It is almost the only area in the county where the student can study the very interesting ecological associations of plants and animals characteristic of a sand-dune biota. This study has indeed attracted Yorkshire workers in the past and many of the elements of the associations have already been recorded. There is no need here to repeat this information which can be gleaned from the Circulars Nos. 281 and 340 and from reports in the pages of *The Naturalist*, such as that for the meeting of 1928 (pp. 275-277). As an illustration the following coastal beetles which have been recorded from the area may perhaps be mentioned : *Broscus cephalotes* (L.), *Aegialia arenaria* (F.), *Notoxus monoceros* (L.), *Phylan gibbus* (F.), *Cylindronotus laevioctostriatus* (Gze.), *Euchlora (Anomala) dubia* v. *aenea* (Deg.), and *Cleonus piger* (Scop.), etc.

The labours of past students have resulted in long lists of recorded species, many of which are of great interest, in the orders Lepidoptera, Coleoptera, Hemiptera, and in the Arachnida. The order Diptera is strong in maritime species and some interesting records already exist. In the Hymenoptera, except for some Aculeates, little has been recorded and a vast field offers itself for extending our knowledge of littoral ecology by investigating the parasitic Hymenoptera associated with the sand-dune species. When the Welwick Salt Marshes are visited the entomologist will be able to work a different type of ground yielding additional species of great interest. This area has received less attention than the sand dunes of Spurn.

The estuarine fauna of the Humber foreshore will repay close attention. Here both species of *Dicheirotichus* occur, together with many species of *Bembidion*, *Broscus*, etc. The drains and ponds of the area produce many interesting water-beetles and other aquatic insects.

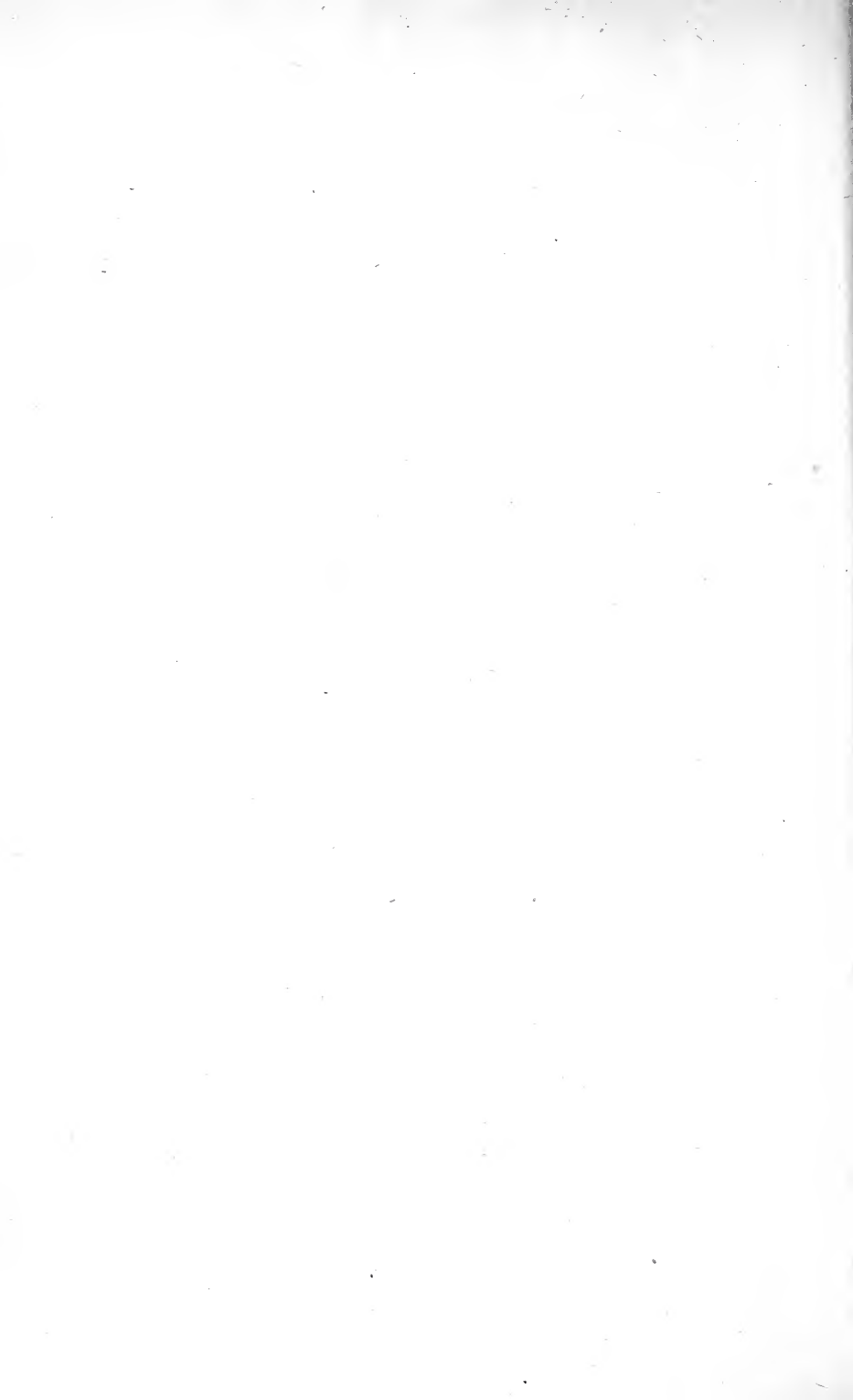
**MEETINGS.**—Tea, 2/6, will be provided at Headquarters at 5-30 p.m. on Monday. A General Meeting will follow for the election of new members and to receive reports from the various sections.

A short meeting of members of the Executive will be held later to discuss the question of Exchanges and Transactions.

CHRIS. A. CHEETHAM.

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The next meeting is June 22nd at Ainderby Bottoms (Northallerton).





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## Divisional Secretary:

JOHN P. UTLEY, B.Sc., Brompton, Northallerton.

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## The 468th Meeting

WILL BE HELD AT

# AINDERBY STEEPLE

## On Saturday, JUNE 22nd, 1946

for the investigation of Ainderby Bottoms and Poole's Waste

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**HEADQUARTERS.**—The Station Hotel, Northallerton, where tea has been arranged for 5-15 p.m., to be followed by the meeting. Anyone wishing to book a room *must* write early.

**PERMISSION** to visit Ainderby Bottoms has been given by Mr. Charlton, of Ainderby Steeple, and to visit Poole's Waste by Mr. Peacock, of Little Langton Grange.

**TRAVEL.**—The Railway Company will not guarantee that the train times given in the present time-table will be in operation by June. A new and enlarged time-table is being issued in May, but being on the main line there are good trains to York and Leeds.

Buses passing through Ainderby Steeple leave Northallerton at each hour, from 9 a.m., and pass the east corner of the Station Hotel (three minutes from Railway Station). The journey takes ten minutes.

**Route.**—The party will assemble on the Village Green at Ainderby about 10-30 a.m. The little lane which leaves the north-west corner of the Green and crosses the railway line, leads to the Bottoms, which open out almost immediately on the east side.

Those who desire to explore something of the River Swale are advised to go through Morton-on-Swale, cross Morton Bridge, pass through the first gate on the right-hand side and work upstream.

Anyone wishing to visit Poole's Waste should contact the Divisional Secretary or Mr. Ralph Chislett.

It is particularly requested that care be taken to avoid damage to crops and that all gates are securely fastened.

For a complete exploration of Ainderby Bottoms rubber knee boots are essential, thigh boots are better. Warning is given that during the summer months the

Bottoms are inhabited by a particularly vicious gnat, the full effect of whose attentions are delayed.

**GEOLOGY.**—The area forming the Bottoms is a basin filled with peaty alluvium overlying Keuper and Bunter Sandstone, with evidences of drift and moraine in the vicinity. Less than a century ago the area was valuable grazing land, though the existing main dikes were present. The main outfall (New Dike) through neglect of clearance gradually became choked and for about 40 years approximately 100 acres have been marsh. Negotiations are now in progress with the Ouse Drainage Board for the re-opening of the dikes and drains. Since the visit was arranged portions of the Bottoms have been burnt as a preliminary to further work. This action may most affect the botanists.

Poole's Waste is formed by an ox-bow of the River Swale having been cut off by natural river action about 70 years ago. The enclosed area is about 30 acres and valuable agricultural land. The waste is actually in the Parish of Kirkby Fleetham and used to belong to a farm south of the Swale. An old man in Kirkby Fleetham remembers carting corn away from the Waste when the neck of land was no wider than the cart track.

The bed still takes flood water when the Swale is high and always holds water by reason of subsidiary streams draining into the old bed of the river.

**BOTANY.**—Little is known of the botany of Poole's Waste, but in a large bed of *Impatiens Noli-tangere* is a fine specimen of *Heracleum giganteum*.

Regarding Ainderby Bottoms, Miss C. M. Rob writes : Ainderby Bottoms is one of the few remaining very wet spots in the Central Valley and seems to have been rather neglected by botanists in the past. My own knowledge is scant, having but once visited the area, and then only for about an hour, in which time *Ranunculus lingua* L., *Hottonia palustris* L., *Stellaria glauca*, *Hydrocharis morsus-ranae* and *Carex disticha* were noted.

Mr. W. Foggitt records *Myriophyllum verticillata* from Ainderby Car, which appears to be the same place.

*Circula virosa* 'grows in ditches about the Swale at Ainderby Steeple,' and in Ainderby Car, according to J. G. Baker, and this should be looked for as drainage has exterminated it in most Yorkshire localities.

Since receiving the above it has been confirmed that Ainderby Car and Ainderby Bottoms are the same place.

**VERTEBRATE ZOOLOGY.**—It has not been possible to ascertain the extent of mammalia present. Foxes are known to use the area.

The breeding season will be in full swing in the bird world. The following birds are known to have bred within the area : Carrion Crow, Jackdaw, Magpie, Starling, Linnet, Chaffinch, Tree Sparrow, Corn Bunting, Reed Bunting, Skylark, Tree Pipit, Meadow Pipit, Great Tit, Blue Tit, Willow Warbler, Grasshopper Warbler, Reed Warbler, Sedge Warbler, Song Thrush, Blackbird, Whinchat, Redstart, Robin, Hedge Sparrow, Mallard, Teal, Little Grebe, Wood Pigeon, Turtle Dove, Lapwing, Common Redshank, Common Snipe, Black-headed Gull, Moorhen, Coot, Pheasant and Common Partridge.

Birds seen on passage or resident for but a short period include Long-Eared Owl, Marsh Harrier, Shoveler and Bar-tailed Godwit.

Birds also known to breed at Poole's Waste are Greenfinch, Goldfinch, Long-tailed Tit, Spotted Flycatcher, Wood Warbler, Garden Warbler, Blackcap, Whitethroat, Mistle Thrush, Sand Martin, Kingfisher, Kestrel and Water Rail.

**ENTOMOLOGY.**—It has not been possible to contact anyone with a knowledge of the areas, but if quantity and variety are anything to go by there should be some good hunting—but beware gnats : the warning is given from experience.

**NOTE.**—Buses leave Ainderby Steeple for Northallerton at 12 minutes to the hour. There are no buses operating in the vicinity of Poole's Waste.

**MAPS.**—Sheet 21. One inch to the mile. For those who possess gridded maps (military grid) the references are : approx. centre, Ainderby Bottoms, 814128. Poole's Waste, the cut-off ox-bow in 7814.

**MEETING.**—A meeting will be held after tea at Headquarters (5-15 p.m.) for presentation of reports from the Sections and for the election of new members. The next meeting will be at Ilkley on July 6th, 1946.

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## Local Secretary :

W. F. FEARNLEY, 2 Eaton Road, Ilkley.

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## The 469th Meeting

WILL BE HELD AT

# ILKLEY

ON

## SATURDAY, JULY, 6th, 1946

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**HEADQUARTERS** for Tea and Meeting after the excursion : Stoney Lea Hotel, Cowpasture Road, Ilkley. A substantial afternoon tea will be supplied at 3/- per person, but the proprietor states that it is essential that the number of teas required be known well in advance. Will those requiring tea therefore please inform the Secretary (Mr. Chris. A. Cheetham, Austwick) at least a fortnight before the date of the meeting.

**PERMISSION** to proceed over their land has been given by Mrs. Hill (Denton) and Col. J. B. Grotrian (Burley Moor).

**Route.**—Morning : Leader, Mr. Walter Flesher, keeper of Burley Moor. Meet outside Ilkley Railway Station and leave at 9-30 a.m., going up Wells Road, past Wells House Hotel, and up Spicey Ghyll on to the moor, then proceeding eastwards across Ilkley Moor to Burley Moor, eventually working back to the Cow and Calf area, where a halt will be made for lunch (members should bring their own food for this meal, but it is hoped to arrange for cups of tea at the Highfield Hotel close by). After lunch descend footpath to Ben Rhydding and down Wheatley Lane to Toll Bridge.

Afternoon : Leader, Mr. Fred H. Ball, keeper of Denton Estate. Cross Toll Bridge at about 1-45 p.m. (late arrivals could conveniently join the party here), turn right and proceed along river bank to Hundwith Beck at east end of Denton

Park, follow beck northwards through woods up to edge of moor, turn west and south and work back through west portion of Denton Park, by lake and back *via* Toll Bridge to headquarters for tea at 5 p.m. prompt.

**TRANSPORT.**—There are buses every half hour to Leeds and Bradford, but members should ascertain times of these and of trains nearer the date of the meeting, as the services may be altered. For those coming by car there is a car park just off Brook Street, close to the railway station.

**BIRDS.**—W. F. Fearnley writes : The varied type of country in this area, covering moorland, woodland (both mature and young trees), pasture and arable land, with several small sheets of water, besides the river and its tributary streams, supports a good number of birds at this time of year. Given reasonable luck about seventy species should be noted, with the possibility of about twenty more.

On the moor edge Linnets nest, the Twite has been known to nest, though not recently, Ring Ousel and Stonechat bred along the route last year, and Nightjars come to the bracken slopes. Higher up are Wheatears, and Short-eared Owls' nests have been found during several years past. Merlin and Kestrel may be met with up there, and Teal near the reservoirs. Stockdoves nest in holes on the moor. Curlew, Dunlin and Golden Plover breed.

Jays are now frequently noted in the woods in the valley. Hawfinches have been reported several times this spring in gardens. Goldfinches are not common but are increasing, Bullfinches are more frequently observed, and also Reed Buntings. Tree Sparrows may be seen. The Marsh Tit is often found in the woods, and as the Willow Tit has been reported at Farnley, only a few miles away, it may also occur here. The Pied Flycatcher passes this way occasionally, but has not yet been recorded as breeding here. The Chiff-chaff is rare in this area, Willow Warbler, Wood Warbler, Garden Warbler and Whitethroat being the most frequently noticed warblers, and occasionally a Sedge Warbler. Whinchats may be seen, and Redstarts almost certainly. There are several Dippers on this stretch of the Wharfe, and several Sand Martin colonies in the banks, and a few pairs of Kingfishers rear broods. Both Green Woodpecker and Great Spotted Woodpecker are in the woods. Little Owls are increasing. Tawny Owls are often noted, and sometimes Barn Owls. Sparrow Hawks have nested, sometimes successfully. There are often Little Grebes on the river and ponds. Snipe, Woodcock, Common Sandpiper and Redshank are all regular breeding species. The Corncrake still comes to the district, and was heard last year not far from the route of this excursion.

**ENTOMOLOGY.**—Mr. W. D. Hincks writes : Wharfedale has always been a favourite collecting ground for the entomologists of Leeds and Bradford, and consequently there are extensive records in the more generally studied orders of insects. These show quite clearly that the district is a good one for the entomologist, the diversity of habitats providing ample interest for even the most specialised student. It is fruitless to quote from the long lists of insect records and reference will be limited to a few general features of the area around Ilkley.

The high moors above the town produce many of the characteristic insects of our north-country moorlands and the sphagnum pools yield a rich harvest of water-beetles and other aquatic forms. The common *Chironomus* of these Ilkley pools is the arctic *C. lugubris* Zett., which flourishes in Spitzbergen, Bear Island and other northern latitudes. In the valley, on the other hand, the rich and varied vegetation attract many lowland species. The coleopterist should pay particular attention to the more prominent plants of the neighbourhood. Thus sweeping *Geranium pratense* L. should produce the weevils *Zacladus* and *Limobius borealis* (Pk.) in numbers, and if not too early, the rare *Aphthona pallida* subsp. *nigriceps* (Redt.). Dipterists, too, may find the plants of the district specially productive of their associated species, but our visit is too late to produce adults of the very local *Platyparella discoidea* (F.) on *Campanula latifolia* L. The late Mr. G. Grace spent several years in Ilkley working on the Chironomid flies and the many records are a memorial to his careful investigations. Many of these midges are known only



in Britain from Ilkley and many others have very few other localities besides Ilkley. *Metriocnemus graciei* Edw., *Hydrobaenus graciei* (Edw.) and *H. ilkleyensis* (Edw.) may be cited as examples. Chironomids are, of course, essentially members of the aquatic life of the area and here Wharfedale is richly provided. The River Wharfe itself, its tributary becks and the ponds and pools have a most interesting and varied insect fauna which has always proved a strong attraction to Yorkshire biologists (for instance, see Percival and Whitehead, 1929, *Journ. Ecol.*, 17, 282-314). Mayflies and Stoneflies abound, accompanied by many species of Caddisflies. We have already mentioned the Chironomids and amongst other aquatic Diptera the curious larvae and pupae of the biting flies of the genus *Simulium* may be observed in many of the swifter-flowing streamlets of the district. The aquatic beetles of Wharfedale include the local, hairy Whirligig, *Orectochilus villosus* (Mll.) and many other interesting species.

The lepidopterist will find many records from the district in Porritt's *List*, but the student of the Hymenoptera, especially the parasitic families will have a virtually unworked field.

The usual species of Dragonflies are amongst the aquatic life of the valley, and it must not be forgotten that nearby, above Burley, the fine southern *Anax imperator* Leach, has been seen, but has so far eluded capture.

**BOTANY.**—Miss E. M. Brown writes: The district to be visited around Ilkley includes, on the south side a stretch of Ilkley and Burley Moor. There typical moorland associations are to be found. The higher dryer parts show true moorland vegetation dominated by *Calluna vulgaris*, and including *Empetrum nigrum*, *Vaccinium myrtillus*, *Vaccinium oxycoccus*, *Erica tetralix* occurring in wetter places.

Patches of bog show a sphagnum association in which occur *Eriophorum vaginatum* and *E. angustifolium*, *Narthecium ossifragum*, *Hydrocotyle vulgaris*, *Drosera rotundifolia* and *Pinguicula vulgaris*.

In the grassy areas, *Nardus stricta* and *Agrostis canina* are to be found with *Galium saxatile*, *Potentilla erecta*, *Luzula campestris*, *Pedicularis sylvatica*.

Small groups of pines and much gorse and bracken cover the lower northern slopes of the moor, where also *Empetrum nigrum* is very abundant and spreading among the bilberry and calluna.

Mosses on the moor include *Hypnum cupressiforme*, *Webera nutans*, *Dicranum scoparium*, *Plagiothecium undulatum* and many interesting species.

The riverside and oak woods on the northern side yield a plentiful flora of interesting flowering plants and mosses, among which may be mentioned *Adoxa moschatellina*, *Chrysosplenium oppositifolium*, *Chrysosplenium alternifolium*, *Doronicum Pardalianches* (naturalised), *Lathraea squamaria*, *Cardamine amara*, *Draba verna*, *Silene cucubalus*, *Claytonia perfoliata*, *Inula Helenium*.

**GEOLOGY.**—Mr. A. Charlesworth writes: The area shows a succession of divisions of the Millstone Grit, chiefly sandstones and shales. These are described, particularly the differentiation by fossil evidence, in a paper by Stephens and others, in *Proceedings of the Yorkshire Geological Society*, Vol. XXIV, Part 5, 1941. The particular fossils which have enabled this identification to be accomplished are the Goniatiles, and it is W. S. Bisat, of the Yorkshire Geological Society, who should be mentioned specially in this connection. The following are the faunal divisions in the area, commencing at Beamsley and travelling southwards towards Baildon (starting from the *Lower* and going upwards to the *Higher*):

1. Lower Eumorphoceras zone (or E1) or Skipton Moor Grit Group.
2. Upper Eumorphoceras (or E2) or Silsden Moor Grit Group.
3. Homoceras (H group) or Middleton Grit Group.
4. Lower Reticuloceras (or R1) or Kinderscout Grit Group.
5. Upper Reticuloceras (or R2) or Middle Grit Group.
6. Gastrioceras (or G) or Rough Rock Group.

The latter Group is succeeded, at Baildon, by the Lower Coal Measures, which form an outlier in a belt of Rough Rock.

Ilkley itself is situated on the H or Middleton Grit series, although most of the rock is overlain by moraine material. The lower part of Heber's Gill cuts into this zone. In Spicey Gill we encounter the most important rock of the area—particularly in relation to the topography. This is the R<sub>1</sub> or Kinderscout Grit Group, and which gives rise to features such as Addingham Edge, Woodhouse Crag (with the swastika stone), Cow and Calf, Hanging Stones, Rocky Valley, etc.

About 1½ miles to the south of the Cow and Calf Rocks are Lanshaw Delves—a well-marked lateral moraine (see Kendall and Wroot, *Geology of Yorks.*, p. 882).

The Cow and Calf Rocks and Hanging Stones lie in a faulted area. One fault lies to the east of this group, between them and Pancake Ridge, and runs near the Ben Rhydding Hydro towards Denton. The other commences in the upper part of Cow Close Gill, and runs towards Ilkley Station.

The upper part of Backstone Beck is known as Cow Close Gill and gives excellent exposures of the Kinderscout Grit Series (or R<sub>1</sub>).

About half a mile to the south of Lanshaw Delves the R<sub>2</sub> or Middle Grit Group commences, and finally gives way to the topmost group of the Millstone Grit, or Rough Rock (G) (near the well-known hostelry, 'Dick Hudson's') at Eldwick Crag.

Returning to the Wharfe Valley at Denton we come back to the E<sub>2</sub>, or Silsden Moor Grit Series, an important group on which lies Askwith, Otley and Weeton (with Almscliffe Crag). March Gill is situated on this zone.

Returning to Ilkley by way of Middleton Woods, which show morainic material (as also the cemetery on the Right Bank), we find rocks of the H or Middleton Grit Series. Between Ilkley and Addingham the Wharfe cuts below the H Series into the underlying E<sub>2</sub> Group.

Other features of note, apart from the moraine on which the parish church lies, are the alluvial flat between Manor Park (on a moraine) and the Toll Bridge—and another on which the football and cricket fields are situated—and the sudden diversion of the Wharfe at the Swing Bridge, probably by the moraine on which lies the cemetery.

#### REFERENCES.

- Proc. Yorks. Socy.*, Vol. 24, Pt. V., 1941.  
Kendall and Wroot, *Geol. of Yorkshire*, pp. 880-883.
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**MEETING.**—A meeting will be held following the tea at 5 p.m. at Stoney Lea Hotel, Cowpasture Road (3/-), when reports will be made on the excursion and new members elected. The next meeting is at Robin Hood's Bay on July 20th.

# Yorkshire Naturalists' Union.

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## President :

A. A. PEARSON, F.L.S., Hindhead.

## Hon. Treasurer :

S. D. PERSY FISHER, Sackville Street, Leeds.

## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## Local Secretary :

J. MEIKLE BROWN, "Carterknowle," Robin Hood's Bay.

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## The 470th Meeting

WILL BE HELD AT

# ROBIN HOOD'S BAY

## On Saturday, JULY 20th, 1946

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**HEADQUARTERS.**—Haslop's Cafe, Robin Hood's Bay, where tea will be provided at 5-30 p.m., at 1/3 per head. Members requiring tea should send a post-card not later than Friday, July 19th to Mr. J. M. Brown, "Carterknowle," Robin Hood's Bay.

**APPROACHES.**—Robin Hood's Bay is reached by rail or bus from Whitby, and by rail from Scarborough.

Trains from Whitby arrive at 9-7\* a.m., 10-16\* a.m., 10-50\* a.m., 11-45 a.m., 2-37\* p.m.

Trains from Scarborough arrive at 9-5 a.m., 10-15\* a.m., 11-46\* a.m., 12-32 p.m., 2-1\* p.m.

Trains leave for Whitby at 5-25 p.m., 8-55 p.m.

Trains leave for Scarborough at 4-49 p.m., 6-37 p.m.

Buses leave for Whitby at 5-30 p.m., 7-30 p.m.

\* Saturdays only.

**MAPS, ETC.**—The district is included on Sheet 16 of the 1-inch Ordnance Survey (Popular Edn.). Y.N.U. Circular 374 for the Easter Meeting of 1933, and the report of the meeting in *The Naturalist*, June, 1933, give further information.



**Routes.**—Members arriving by the early trains are recommended to spend the morning on the shore or along the cliffs (according to the state of the tide), or on “Brockets,” returning in time for the afternoon excursion.

For the afternoon meeting, meet at the Station. On the arrival of the mid-day trains from Whitby and Scarborough (approximately 12-45 p.m.), proceed to Raw by way of Linger’s Fields, Bedlington Lane and Bridle Path. Cross the edge of the moor and make for Ramsdale. Through Ramsdale, and by way of Swallow Head reach Fylinghall. Proceed along Bridge Holm Lane to the beach at Mill Beck, and continue to Robin Hood’s Bay either by way of the beach or along the cliffs.

**Permission**—Permission to investigate the woods, etc., in the upper part of Ramsdale has kindly been granted by Councillor H. Greaves of Leith Rigg, and H. B. Smith, Esq., of St. Ives Farm.

**THE DISTRICT.**—Fylingdales, that is the district immediately inland from the Robin Hood’s Bay, has the form of a semicircular basin hollowed out from the high ground, mainly by ice action. The area within the basin is largely agricultural land, with two main streams traversing it, and entering the sea at Mill Beck and Stoupe Beck. The narrow valleys occupied by the becks are well-wooded especially in their lower regions, and afford good opportunities for interesting work by the freshwater biologists. The high ground is largely moorland. The bay itself, one of the most picturesque on the coast, is well known to the marine biologist, as the reefs are particularly rich in both marine animal and plant life. The bay is also historic ground to the geologist. The cliffs, which largely consist of boulder clay resting on liassic shales, are apt to be very sticky after wet weather. Bay Town occupies the northern extremity of the bay.

**BOTANY.**—The district is not remarkable for a large number of rare plants, but is characterised by the profusion of flowers forming extensive carpets of colour in the woods and fields, and on the lanes. Early in the year primroses (but no cowslips), violets, daffodils, goldilocks, celandines, anemones and gorse, followed later by broom, early purple and spotted orchis, golden saxifrage and marsh marigolds produce a wealth of colour, while the hedges are gay with blackthorn, whitethorn, honeysuckle, wild rose, and bramble, followed by a profusion of berries, not forgetting the black bryony, Guelder-rose and rowan. The following less common plants may be mentioned as occurring here : Spurge Laurel (*Daphne laureola*), Grass of Parnassus (*Parnassia palustris*), Marsh Cinquefoil (*Potentilla palustris*), Chickweed Wintergreen (*Trientalis europea*), Green Hellebore (*Helleborus viridis*), Corn Crowfoot (*Ranunculus arvensis*), Shepherd’s Needle (*Scandix Pecten-Veneris*), Centaury (*Erythraea Centaurium*), Sundew (*Drosera rotundifolia*), Butterwort (*Pinguicula vulgaris*), Winter Heliotrope (*Petasites fragrans*), Arrow-grass (*Triglochin palustre*) and Adder’s Tongue fern (*Ophioglossum vulgatum*). Orchids are fairly plentiful (some abundant), and include : Early Purple (*Orchis mascula*), Spotted (*O. maculata*), Broad-leaved Helleborine (*Epipactis latifolia*), Tway-blade (*Listera ovata*), Frog (*Habenaria viridis*), Fragrant (*H. conopsea*), and Butterfly (*H. bifolia*).

**VERTEBRATE ZOOLOGY.**—Fylingdales is quite rich in animal life and the following species have been noted :

**Mammals.**—Fox (plentiful), Badger (now scarce), Stoat, Rabbit (less numerous than a few years ago), Hare (not common), Field Vole, Long-tailed Field Mouse, Red and Grey Squirrel, Mole, Shrew, Hedgehog, Bat (Pipistrelle). The Water Shrew has been seen, but the Water Vole seems to be absent.

**Birds.**—The area seems rich in bird-life, and over 70 species are known to me to occur, of which 36 occurred in the Ramsdale district, and 35 have been seen in or near my own garden. The following are perhaps the most interesting : Jackdaw (very plentiful), Magpie (plentiful), Jay (less common), Greenfinch, Goldfinch, Bullfinch, Yellow Bunting (common), Yellow and Pied Wagtail, Tree-creeper, Cole Tit, Marsh Tit, Long-tailed Tit, Waxwing, Spotted Fly-catcher, Whitethroat, Fieldfare, Redwing, Wheatear, Stonechat, Redstart, Dipper, Night-jar, Great Spotted Woodpecker, Green Woodpecker, Barn and Tawny Owl, Kestrel,

Sparrow-hawk, Kingfisher (scarce), Snipe and Jack Snipe. On the shore the commonest species are the Herring, Black-backed and Blackheaded Gulls and the Cormorant.

**Reptiles.**—Include the Viper (numerous on the moors), Slow-worm, and Common Lizard.

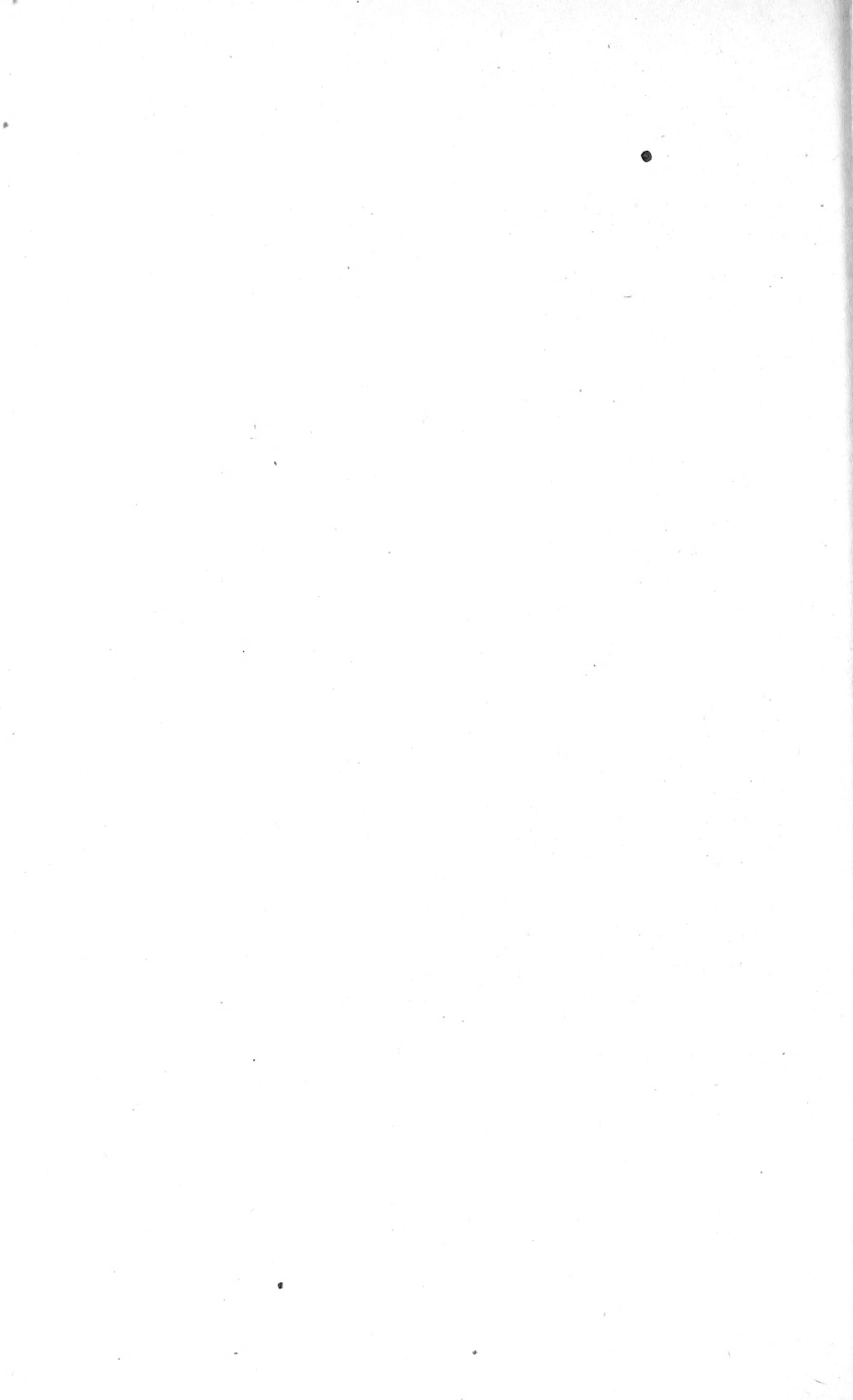
**Amphibia.**—Include Toad, Frog and Newt (all plentiful).

**ENTOMOLOGY.**—Abundant opportunities are afforded to the entomologist as the insect life of Fylingdales is both abundant and varied. A considerable amount of work has been done by the writer during the last few years, and accounts have appeared in *The Naturalist* (1937, pp. 88-93; 1938, pp. 201-206; 1941, pp. 167-172; 1944, pp. 124-127), dealing with the Hemiptera, Neuroptera, Psocoptera, Plecoptera, Ephemeroptera, Trichoptera and Hymenoptera-Symphyta, to which papers those who are interested may be referred. In the following notes only a few of the more striking species found on the routes to be followed can be mentioned. On the Moor the Painted Lady and Green Hairstreak butterflies, the Emperor and Northern Eggar moths occur. The Green Tiger beetle (*Cicindela campestris*), *Cychrus rostratus*, *Carabus nitens*, and the Heather beetle (*Lochmaea suturalis*) may be seen (this last species occurred in vast numbers in 1944, and did a considerable amount of damage), and *Cymindis vaporariorum* should be looked for. The Solitary Ant (*Mutilla europaea*) is sometimes seen. Of the Hemiptera, *Piezodorus lituratus* should be seen on gorse; beneath the heather *Ischnorhynchus ericae*; *Cyrtorhinus caricis* and the rarer *Globiceps dispar* at the roots of rushes; and on broom *Anthocoris sarothamni*, and *Heterocordylus leptocerus*. In grassy places the grasshoppers *Myrmeleotettix maculata* and the short-winged *Chorthippus parallelus* occur. By the pools higher up on the moor can be seen the dragonflies *Aeshna juncea*, *Sympetrum striolatum*, *S. flaveolum*, *S. danae*, *Pyrrhosoma nymphula*, etc. About here the large and conspicuous spider *Aranea quadratus* has been taken. In Ramsdale a considerable number of butterflies occur including: Dark Green and Small Pearl-bordered Fritillaries, Peacock, Red Admiral, Small Skipper, Meadow Brown, Small Heath, Small Copper, Common Blue, Orange Tip, and a look out should be kept for the Wall-butterfly (which has been seen here once recently). Several longicorn beetles are found here, such as *Clytus arietis*, *Grammoptera ruficornis*, *Leiopus nebulosus*, *Pogonochaerus hispidus*, and *Leptura maculata* (as many as 20 were seen together on *Myrrhis umbels*). Plant bugs are plentiful and include *Acanthosoma haemorrhoidale*, *Pentatoma rufipes*, *Calocoris ochromelas* and *C. striata*, and the rarer *Lopus gothicus* and *Strongylocoris leucocephalus*. The grasshoppers *Omocestus viridulus* and *Chorthippus bicolor* are abundant and perhaps the small *Acridium vittatum* may be found. Ramsdale is a good region for Sawflies and some conspicuous ones occur such as *Pamphilus silvaticus*, *P. pallipes*, *Tenthredo maculata*, *T. mesomelas*, *Tenthredopsis carbonaria*, *Macrophya annulata*, *Dolerus madidus* and others. Near Fyling Old Hall the local Lacewing *Nathanica capitata* has been taken.

**FRESHWATER BIOLOGY.**—Ramsdale Beck flowing through the rough piece known locally as 'Brookets' affords an opportunity of examining a typical beck with stoney bed. It is a breeding place for numerous Stoneflies, May-flies and Caddis-flies, the adults of which occur near at hand. The best species taken here include: *Perlodes mortoni*, *Capnia nigra* (the rare *C. vidua* is found in Howdale), *Taeniopteryx risi*, *Leuctra moselyi*, *Amphinemura standfussi*, *Nemoura avicularis*, *N. cambrica* (Stoneflies); *Ephemera danica*, *Paraleptophlebia cincta*, *Habrophlebia fusca*, *Ecdyonurus dispar* (Mayflies); *Stenophylax permistus*, *S. latipennis*, *Halesus digitatus*, *Odontocerum albicorne*, *Sericostoma personatum*, *Crunoecia irrorata*, *Glossosoma boltoni*, and *Hydroptila maclachlani* (Caddis-flies).

**MEETING.**—A meeting for the presentation of reports on the excursion and for the election of new members will be held at Headquarters following after the Tea, 5-30 p.m.

The next meeting will be at Thorne on Saturday, August 3rd, 1946.



# Yorkshire Naturalists' Union.

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## President:

A. A. PEARSON, F.L.S., Hindhead.

## Hon. Treasurer:

S. D. PERSY FISHER, Sackville Street, Leeds.

## Assistant Treasurer:

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## Local Secretary:

Dr. J. M. TAYLOR, 1 Silver Street, Thorne, near Doncaster.

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## The 471st Meeting

WILL BE HELD AT

# THORNE WASTE

## On Saturday, AUGUST 3rd, 1946

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**HEADQUARTERS.**—The Red Lion Hotel, Thorne (Proprietor: Mr. F. Grimoldby). At present it is not possible to get food, but liquid tea will be available and members should bring their own food. High tea can be provided at the Silver Street Café. Members wishing this should write in good time to the Manageress, The Silver Street Café, Thorne, near Doncaster.

**TRAVEL ARRANGEMENTS.**—There are two railway stations at Thorne. Trains leave

Thorne South for Doncaster at 4-55 p.m. and 7-39 p.m.

Thorne North for Hull at 5-54 p.m. and 6-58 p.m.

Trains from Doncaster: 9-12 a.m., 11-33 a.m., 11-46 a.m.

Trains from Hull: 9-15 a.m.

Buses leave Christ Church, Doncaster, for Thorne half-hourly at the hour and half-past.

Return buses leave Thorne at 10 minutes past the hour and 20 minutes to the hour.

**MAPS, ETC.**—The area is mostly on the large sheet series, 1 mile to inch, Sheet 32.

Y.N.U. Circular 203, which is bound up in Part 34, *Trans. Y.N.U.*, has geological notes by H. Culpin, who states that the *solid* geology is Trias, but this is peat covered up to 20 ft. in thickness. The nearest exposure of solid rock is at Crowle. Dr. H. H. Corbett and Mr. J. E. Crowther gave short lists of mollusca.

**PERMISSION.**—Mr. P. Walker and Mr. Birtwistle have granted permission to use the occupation road to the Moors and to go on to their territory at the south end.

Mr. A. Chapman, Secretary of the Thorne Moss Litter Co., has also given us the necessary permission, but members must strictly observe that **smoking** is prohibited and danger of fire is great.

The party will leave headquarters about 10-40 a.m., after the arrival of the 10 a.m. bus from Doncaster, and proceed by the Church Balk to the Waste. Later buses will be met and members directed to the Waste.

Dr. J. M. Taylor writes : Thorne Waste is an extensive peat bed lying about 2 miles to the east of Thorne. The peat is (or was) from 6 to 20 ft. thick. Drainage and peat-cutting have so altered the Waste that not one acre is left in its original condition. Remains of the old forest are frequently seen in the peat cuttings.

The commercial working of the Waste has caused the disappearance of *Scheuchzeria*, *Carex limosa*, *Rhynchospora alba*, *Lastrea cristata*, and the *Droseras* except the common *rotundifolia*.

At the south end, which it is proposed to visit, the denuded moor has been warped and is now farm land, but the borders are the most interesting botanical area left. *Lathyrus palustris* survives and *Peucedanum palustre* has increased a little recently. *Cirsium dissectum* and *Myrica Gale* are well established. *Viola palustris* is plentiful, *V. canina* L. frequent, and the small patch of *V. stagnina* should be seen seeding. The hybrid *Dryopteris dilatata* × *D. spinulosa* occurs in several places. *Calamagrostis lanceolata* is abundant. *Andromeda polifolia* is frequent in the peat. Along the occupation road leading to the Waste are plenty of *Carex elata*, *C. gracilis*, and *C. acutiformis*, while *C. vesicaria*, *C. curta*, and *C. Goodenowii* var. *juncella* grow along the borders.

Other plants of the moor borders are *Ranunculus circinatus*, *R. sceleratus*, *Corydalis claviculata*, *Erysimum cheiranthoides*, *Stellaria aquatica*, *S. glauca*, *Hypericum dubium*, *Oenanthe Phellandrium*, *Bidens cernua*, *B. tripartita*, *Euonymus europaeus*, *Helminthia echinoides*, *Utricularia vulgaris*, *Juncus Gerardi*, *Scirpus Tabernaemontani*, and *Ophioglossum*.

**ENTOMOLOGY.**—Mr. E. G. Bayford, F.R.E.S., writes : I look forward to being at Thorne, where, with Dr. Corbett, I have spent many happy days. Thorne is a fine hunting ground, and, given decent weather, the hotter the better, a good time should be had by all.

**LEPIDOPTERA.**—Although it seems certain that *Papilio Machaon* occurred on Thorne Waste in the early years of the last century, it is equally certain that it no longer exists there, but its food plant, *Peucedanum palustre*, still lingers.

*Phragmatobia fuliginosa* L., *Sterrhia sylvestriaria* Hüb. (first recorded in Yorkshire from here, and since from Skipwith), *Thalera fimbrialis* Scop., *Eucymatogae scabiosata* Bor., *Anticollis sparsata* Tr., *Deilephila elpenor* L., *Pheosia gnoma* F., *Coenonympha tullia* Mül., *Thymelicus sylvestris* Poda., *Augiades sylvanus* Esp., *Trichoptilus paludum* Zell., *Tortrix viburnana* Sch., *Ancylis laetana* F., *Eucosma maculana* F., *Argyroplotea atropunctana* Zett., *A. striana* Sch., *Hemimene politana* Gn., *Hypatima conscriptella* Hb., *Mompha Raschkiella* Zell., *Depressaria propinquella* Tr., *Gracillaria stigmatella* F., *Nemophora fasciella* F. (first recorded in Yorkshire from here by Dr. Corbett and later from the same area by Rev. C. D. Ash). The nomenclature is that of Kloet and Hincks, 1945.

**COLEOPTERA.**—*Carabus nitens* L., *Dyschirius aeneus* Dej., *Bembidium saxatile* Gyll., *Panagaeus crus-major* L., *Badister unipustulatus* Bon., *Acupalpus luridus* Dej. (the only Yorkshire record, one specimen taken here by Dr. Corbett), *A. consputus* Duft., *Bradycellus ruficollis* Steph., *Amara aulica* Panz., *Hygrotus versicolor* Sch., *H. impressopunctatus* Sch., *Hydroporus granularis* L., *Ilybius 4-guttatus* Lac., *Rhantus grapii* Gyll., *Acilius canaliculatus* Nic., *Hydrochus elongatus* Sch., *Anacaena bipustulata* Mars., *Helochares lividus* Forst., *Berosus luridus* L., *Metopsia clypeata* Mül., *Aploderus caelatus* Grav., *Oxyporus rufus* L., *Stenus nitens* Steph., *Dianous coeruleus* Gyll., *Bolitobius cingulatus* Mann, *Tachyporus scutellaris* Rye., *Adelocera murina* L., *Elater balteatus* L., *Heterocerus maritimus* Guer-Men., *Dermestes maculatus* Deg., *Cryptophagus populi* Payk., *Olibrus aeneus* F., *Rhyzobius litura* F., *Cis bidentatus* Ol., *Anthicus antherinus* L., *Strangalia 4-fasciata* L., *S. maculata* Poda., *Brachytarsus varius* F., *Bagous limosus* Gyll., *Dorytomus salicinus* Gyll., *Cionus alauda* Hbst., *Rhynchaenus foliorum* Mül., *Hylastes ater* Payk. The nomenclature is that of Kloet and Hincks, 1945.

**MEETING.**—A meeting will follow the meal (5-30 p.m.) at headquarters, Red Lion Hotel. Reports will be presented on the work done on the excursion and new members will be elected.

The next meeting at Sandsend, September 14th-20th, will be the Fungus Foray, a joint meeting with the British Mycological Committee.



# Yorkshire Naturalists' Union.

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## President :

A. A. PEARSON, F.L.S., Hindhead.

## Hon Treasurer :

S. D. PERSY FISHER, Sackville Street, Leeds.

## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## Secretary :

CHRIS. A. CHEETHAM, Austwick, via Lancaster.

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## The 472nd Meeting

WILL BE

## A JOINT FORAY

with the British Mycological Society

WILL BE HELD AT

# SANDSEND

ON

## SEPTEMBER, 14th to 20th, 1946

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### Officers of the Yorkshire Mycological Committee :

*Chairman :* Mr. W. D. HINCKS, Leeds.

#### *Recorders :*

Dr. J. GRAINGER, Plant Pathology Dept., West of Scotland Agricultural College.

Mr. W. G. BRAMLEY, Spring Cottage, Pallathorpe, Bolton Percy.

*Hon. Secretary and Convenor :* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

The British Mycological Society celebrate their Jubilee this year. We appreciate their desire to hold the Foray in Yorkshire. They were formed at Selby fifty years ago.

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**HEADQUARTERS.**—The Bungalow Hotel, Sandsend, Nr. Whitby. Terms : 15/6 per day. Will members please write to Capt. A. L. Clarke, saying they are members of the Mycological Committee, or are prospective or working Mycologists,

as accommodation will be reserved for Mycologists until after the requirements of the British Mycological Society, and overseas friends, have been met. Wherever possible will members please share rooms. Most of the rooms contain two single beds.

Some garage accommodation is available.

**BUSES** run from Whitby to Sandsend. There is an hourly service five minutes past the hour from the Bus Station.

### Excursions Programme

**SATURDAY, September 14th.**—People arriving early in the afternoon will proceed to Mulgrave Woods.

**MONDAY.**—A full day at Mulgrave.

**TUESDAY.**—Luxury coach outing to Egton Bridge. Collecting in Arncliffe Woods to Glaisdale returning by Lealholm and Guisborough Moors to Sandsend.

**WEDNESDAY.**—Mulgrave Woods or Grinkle Park.

**THURSDAY.**—Coach to Hackness for explorations of Forge Valley and Raincliffe Woods (western portion), continuing to Ayton.

This is classic ground and Mr. A. A. Pearson and Mr. E. W. Mason were impressed by the area in 1944.

**FRIDAY.**—Free.

Excursions start 10 a.m. each day.

Will members desiring to go on either or both of the Coach Tours, please send a postcard to the Secretary, Miss J. Grainger, Wilshaw, Meltham, Huddersfield, as soon as they receive this circular.

The cost will be (if 60 people go) 3/8 for Egton and Glaisdale and 5/4 for the Forge Valley outing.

**PERMISSION** for visits to Estates has been granted by the following gentlemen, to whom we are very grateful :

1. The Most Hon. the Marquis of Normanby, M.B.E., for permission to visit Mulgrave Woods on the 14th, 16th and 18th of September.
2. R. L. Foster, Esq., Egton Manor, for Arncliffe Woods.
3. Lord Derwent for Hackness.
4. Scarborough Corporation for Raincliffe.
5. Major Palmer for Grinkle Park Estate.

**A WORKROOM** is available at Headquarters with electric light. Adapters will be available and one or two microscope lamps. Will members please bring their own microscopes, mountants, etc. Also members with cars please bring microscope lamps.

**BOOKS.**—Will members please bring their own.

**ANNUAL MEETING.**—The Annual Meeting of the Yorkshire Committee will be held at Headquarters at 8 p.m., Saturday, September 14th.

Chairman's Address will precede the Annual Meeting. Subject: "Entomycology."

**PUBLIC LECTURE.**—Mr. A. A. Pearson (President of the Union) has consented to show his coloured Mycological Slides in the Schoolroom, Lythe, at 7-30 p.m., Monday, the 16th of September.

**PAPERS.**—On the invitation of the British Mycological Society, Dr. Grainger will give a paper (probably September 15th) on 'From Foray to Agricultural Practice' (The Ecology of *Erysiphe graminis*).

**MAPS.**—An excellent one-inch map of Whitby District is available. W. O. Cassini Grid, Sheet 16. For Hackness and Forge Valley, Sheet 23. Bartholomew's half-inch, Sheet 36, covers the whole area.

The Secretary will do her best to deal with requests and suggestions.



# Yorkshire Naturalists' Union.

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## Hon Treasurer :

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## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

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# Sectional Meetings, 1946

OCTOBER 5TH.—SECTIONAL MEETINGS. **Freshwater Biological Section** Annual Meeting, Leeds Church Institute, 3 p.m. The **Conchological Section** will meet in the Geological Department of the Leeds University at 3 p.m. **Geological Section** Annual Meeting, Leeds Church Institute, 3-45 p.m.

OCTOBER 12TH.—The **Botanical Section** will meet in the Theological Library, Leeds Church Institute, 5 Albion Place, at 3 p.m. to consider the Annual Report and nominate officers for the Section and its Committees.

OCTOBER 19TH.—The **Vertebrate Section** will meet at Leeds Church Institute, 5 Albion Place, at 3-15 p.m. to consider the Report and nominate officers. This will be preceded by meetings of the Committees for Ornithology, Mammals, etc., and Wild Birds and Eggs Protection Acts Sub-Committee.

OCTOBER 26TH.—The **Entomological Section** Annual Meeting will be held at the Church Institute, Albion Place, Leeds. 3 p.m. to 5-30 p.m., Exhibits ; 5-30 p.m. to 6 p.m., Tea interval ; 6 p.m. to 8 p.m., approximately, Election of Officers, Records Reports, other business, including a proposal of a Y.N.U. Entomological Expedition to Spurn for a week during June or July, 1947. Will members and visitors please bring exhibits. Tea will be provided but will all please bring any food they can.

An **Executive Meeting** will be held in the Leeds Church Institute, Albion Place, on Saturday, November 2nd, 1946, at 3 p.m. Will all members of the Executive please make a note of this date and time.

**The Annual Meeting** of the Union will be held at Doncaster on December 7th, 1946.



# Yorkshire Naturalists' Union.

---

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## The 474th Meeting

AND THE

## The 85th Annual Meeting

WILL BE HELD AT

# DONCASTER

On Saturday, December, 7th, 1946

The Doncaster Scientific Society have kindly invited the Yorkshire Naturalists' Union to hold their Annual Meeting in Doncaster, and they have made the following arrangements for us.

**THE MEETINGS** will be held in the Doncaster Technical College.

10-30 a.m.—Sectional and Committees.

11-30 a.m.—Executive Meeting.

12-15 p.m.—The General Committee.

The Art Gallery and Museum, Waterdale, will be open for those wishing to visit it, and arrangements have been made for a party to see the Mansion House about 11-15 a.m.

Lunch may be obtained at The Gaumont Café, Hall Gate, at 3/- per head. Those requiring lunch are requested to notify the Hon. General Secretary, Miss D. M. Appleby, 50 St. Wilfrid's Road, Bessacarr, Doncaster, not later than Saturday, 30th November.

The **ANNUAL MEETING** will be held in the Technical College Hall at 2-30 p.m. The Mayor of Doncaster, Alderman H. L. Gee, will give a Civic Welcome to the Union, and will be supported by Mr. N. Smedley, M.A., President of the Doncaster Scientific Society.

The Treasurer and Secretary of the Union will give their annual statements, and the President, A. A. Pearson, F.L.S., will give his Presidential Address, 'The Agarics: A Critical Survey.'

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Will members of the **Executive** and **General Committee** and the Delegates of the Associated Societies please note the above times, as no further notice of these meetings will be sent.

*Hon. Secretary* : CHRIS. A. CHEETHAM.

# The NATURALIST

## A MONTHLY ILLUSTRATED JOURNAL

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(PUBLISHED QUARTERLY IN 1946)

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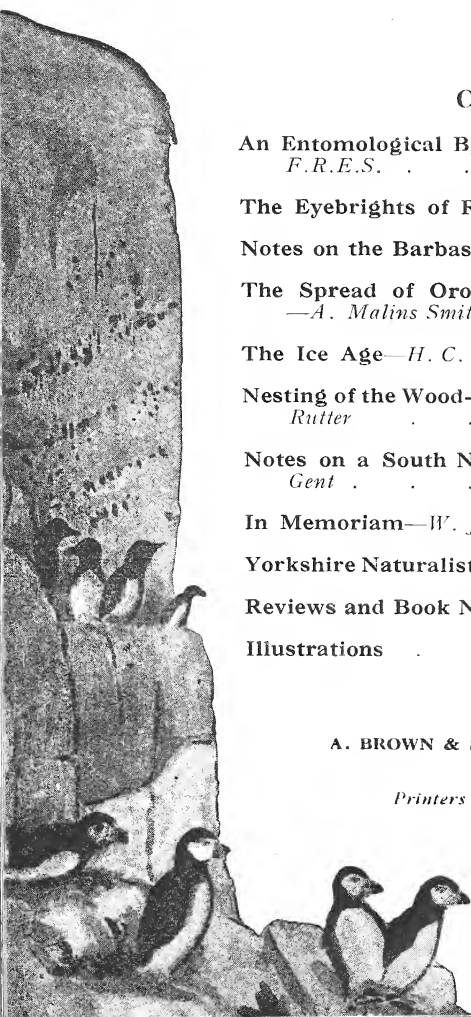
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# THE NATURALIST

FOR 1946

## AN ENTOMOLOGICAL BY-PATH

W. D. HINCKS, M.P.S., F.R.E.S.

(*Presidential Address to the Yorkshire Naturalists' Union, Halifax, December 1st, 1945*)

IN 1928, at Canberra, the Australian Prime Minister stated, in answer to a question put to him that the area overrun by Prickly Pear (*Opuntia*) in Queensland in the years 1908, 1918 and 1928, was 12,000,000, 20,000,000 and 50,000,000 acres respectively. By 1940 it was possible to say that the pest plants were no longer a menace and that in Queensland alone 22,509,970 acres had been reclaimed and developed.

This phenomenal achievement is one of the many practical developments of the subject that I am very briefly and simply discussing in the present paper. It is, indeed, a far cry from such magnificent campaigns to the elementary subject matter of these brief notes, yet it will be well to remember that the incredible results obtained by practical entomologists are based on facts which can be investigated by all however small their leisure and however limited their means.

From the point of view of Yorkshire, and, indeed, of Britain as a whole, it is a neglected subject and offers the greatest opportunities for original and fascinating research. I have, therefore, ventured to think that it would be a suitable subject on which to address the Union, and I have presumed, I confess, to hope that my poor words may stimulate interest in a very neglected branch of entomology amongst the younger and 'unattached' of our members.

Entomology still holds for us something of a spirit of adventure; its vast uncharted spaces invite the sturdy and repel the timid. It is true that certain parts of the subject have now become rather fully mapped, but it is a great pleasure to know that there remain many sequestered paths along which it is exciting to journey guided only by old and often indecipherable sign-posts. The difficulties of the way, though they may be very great, seem light and but just forfeit for the pleasures of the road. Thus I propose to invite you to join me on a brief visit to one of the little used by-paths of British entomology—the study of Parasitic insects.

Furthermore, in this age of new devastating insecticides of the D.D.T. type it has become imperative for us to know our friends from our foes before we destroy both in our ignorance, and the present notes are also intended as a minor contribution to this end.

In many groups of insects it is possible, however wrong such an approach may be, to make some sort of progress at least in their systematics by studying only cabinet specimens. With the subjects of this paper so closely are all the aspects of their biology knit together that it is only possible to advance in a knowledge of them by studies in the field. For this reason perhaps the best way in which I can introduce you to the subject is to ask you to accompany me on an excursion to a country lane—almost any country lane will serve our purpose—where we can make our first acquaintance with these unique insects in the field.

But before setting out there are a few general matters concerning parasitic insects with which we might acquire a passing familiarity, the better to understand the phenomena we shall encounter in our walk.

### I. GENERAL.

#### 1. PARASITES.

A preliminary difficulty is associated with the term 'parasite'—a word of several meanings, covering several different types of behaviour. We commonly think of a parasite as belonging to the same category as the flea or louse, the plant broomrape (*Orobanche*), or even, perhaps, the causative organism of Malaria. The same term is, however, applied to the subjects of the present paper, and Wheeler (1928) expresses the matter so clearly that his words are worth quoting:

'These insects differ from parasites properly so called in three respects. First, they attack other insects and true parasites with the possible exception of certain Crustacea and Infusoria do not attack members of their own phyla; second, they nearly always eventually kill their hosts, and third, they live



with their hosts only during the larval or larval and pupal stages and as adults show no "degenerative" effects of the association. They are, therefore, refined predators.'

Various attempts have been made to provide a distinctive name for these species, and the most generally used is the term 'parasitoids,' but Wheeler concludes:

'It is probable, however, that it will not be generally adopted, and that "parasite" will continue in vogue. If the distinction is clearly understood there can be no harm in such usage.'

Thus we shall use the term 'parasite' in the present notes.

It has been stated that every insect has its parasite. This statement is probably true in a very general way at least of those insects of which we know more than the purely systematic data. The more insects are studied in the field the more are remarkable instances of parasitism brought to light and the lists of parasites associated with the different species of hosts grow at a surprising rate (see Thompson 1944-5). In these insects parasitism is not a degraded condition bringing effectlessness in its train, but a highly respectable and legitimate means of getting a living practiced with unequivocal vigour by vast numbers of different species belonging to as many as five different orders. It is a provision which is intimately tied up with what has been called 'the balance of nature' and fluctuations in parasites or hosts whether natural or man-caused have marked and often disastrous repercussions from the human point of view. In a general way, then, we can say that most insects have other insect species which parasitise them; nor do the parasites themselves escape the application of the rule since hyperparasites or secondary parasites, as they are sometimes called, provide a similar check on parasites as do the latter on their hosts. It is further known that tertiary or even quaternary parasitism occurs, though these conditions are infrequent.

The interrelationships of host, parasite, and hyperparasite tend to become complicated but are matters of the greatest importance in practical problems. The biotic potential as it is called, that is the measure of the ability of an insect to reproduce and survive under optimum conditions, is known to vary considerably in different species. When the biotic potential of a plant feeding species is high it may become a pest under certain conditions. When a parasite has a higher potential than its host it will tend to control it. The mitigating effects of hyperparasites on primary parasites reduce the potential of the latter. The opposing factor to biotic potential is known as environmental resistance and is the sum total of all those environmental forces which work toward the destruction of the insect. Such forces are either biotic or physical and include parasitism in the former category.

## 2. PREDATORS.

Entomophagous insects may be either parasites or predators. Sweetman (1936) defines parasitism as 'that form of symbiosis [using the word in an unfamiliar sense] in which one symbiont lives in or on the host organism and feeds at its expense during the whole of either the immature or mature feeding stage.' Predatism is defined by the same author as 'that form of symbiosis in which one symbiont attacks an individual, or individuals of one or more species, for the purpose of feeding upon it; a limited period of time, less than the immature or mature feeding period, is spent with each victim.' Normally the difference between predators and parasites is quite obvious but not infrequently one type of behaviour merges imperceptibly into the other so that it is difficult to decide which term to apply. Typical predatism, such as the feeding of carnivorous ground-beetles on other insects, is outside the scope of our present subject.

## 3. PARASITIC INSECTS.

There are many thousands of parasitic species amongst Insects belonging to five distinct orders. Of these the two small parasitic families of the order LEPIDOPTERA are not represented in our country. The COLEOPTERA comprises in Britain one parasitic family, the Rhipiphoridae, with one British species, and a few species of Staphylinidae such as *Aleochara curtula* (Goeze), *A. bipustulata* (L.) and *A. bilineata* Gyll., which are obligate external parasites of dipterous pupae within the puparia. The last named is a useful parasite of the pupa of the Cabbage-fly, *Erioischia* (*Hylemya*) *brassicae* (Bouché). The whole of the order STREPSIPTERA, with 17 British species, are parasitic, giving rise to the malformed solitary



bees, which are said to be 'styloized'; *Stylops* being the original genus in which these insects were placed. So profoundly does the parasitism of *Stylops* effect the bee hosts that many of them were at one time regarded as distinct species before the causes of the differences were understood. Some members of the order parasitise species of Homoptera or Froghoppers. The vast order DIPTERA includes some hundreds of parasitic forms in this country belonging to 14 different families. The most important family is the Larvaevoridae or Tachinidae, medium to large bristly flies allied to the House-fly, which attack a wide variety of hosts belonging to several orders of insects. It is the order HYMENOPTERA that presents the largest assemblage of parasitic forms with a bewildering array of fascinatingly different life stories and habits. With the exception of the Sawflies, some Gallflies, a few plant-feeding Chalcids and most of the Aculeates, the whole of the order is parasitic in habit. It is to this vast section of some 5,000 British species that we shall devote our attention.

#### 4. CLASSIFICATION OF THE HYMENOPTERA.

The Hymenoptera is the largest British order of insects having 6,210 species. Imms (1930) defines it in the following terms:

Insects with two pairs of membranous wings, often with the venation greatly reduced, or almost absent; the hind-wings smaller than the fore pair, and interlocked with the latter by means of chitinous hooklets. Mouth-parts primarily adapted for biting and often for lapping or sucking also. The abdomen usually basally constricted and its first segment fused with the metathorax; an ovipositor always present and modified for sawing, piercing, or stinging. Metamorphosis complete; larva generally apodous with a more or less well-developed head, more rarely eruciform with locomotory appendages; tracheal system peripneustic throughout life, or at least in the final instar. Pupae exarate and a cocoon generally present.

The more generally familiar exponents of this order are the Sawflies, Ants, Wasps, and Bees, and through these examples the Hymenoptera will be known to everyone.

The sub-order Symphyta, embracing the sawflies and horntails, is readily distinguished by the sessile abdomen and eruciform larvae of its plant-feeding species from the Apocrita, which have a less broadly sessile abdomen, and whose parasitic or predaceous, rarely phytophagous larvae are apodous. The Apocrita is divided into two series by the position of the ovipositor; the Parasitica, except for the super-family Proctotrupeoidea, having the ovipositor base placed some distance back from the apex of the abdomen; and the Aculeata which has the ovipositor springing from the apex of the abdomen. The Proctotrupeoidea agree with the Aculeata in the structure of the ovipositor, but differ therefrom in having two-joined trochanters.

The vast majority of the British parasitic species belong to the section Parasitica, which includes four super-families and many families, a few of the most important of which may be briefly mentioned. The Aculeata contains relatively few parasitic forms and will not be considered.

(a) *Braconidae*. Many of our commonest and most beneficial parasites belong to this large family of 900 British species and there is no doubt that they play a very important part in checking the increase of many plant pests. All the species are beneficial, with few exceptions, such as the species of *Perilitus*, which parasitises Ladybird beetles (*Coccinellidae*), well known for their valuable role as destroyers of greenfly. The wide range of hosts and the very varied habits of the members of the family render any brief general statement difficult. They attack such hosts as the caterpillars of Lepidoptera and sawflies, larval and adult beetles such as the pest weevils *Sitona* and the wood-boring Death Watch, many Diptera, and Hemiptera, including many species of greenfly. The interesting phenomenon of polyembryony occurs in the family in the genus *Macrocentrus*, and a few species are parthenogenetic. The members of the family are far more diversified in morphology than are the allied Ichneumonidae. Thus they are relatively easily sub-divided into smaller groups, and their identification presents less difficulty than is the case in the Ichneumons. Almost all are primary parasites, and the life-history of *Apanteles* may be taken as more or less typical. The cocoons of species of this genus will, perhaps, be familiar to non-entomologists as they are frequently found in masses on cabbages or nearby when White butterflies are common. These

cocoons vary in colour and in arrangement in different species of the genus. Some are gregarious and form communal cocoon masses, often covered with a common web or even formed into compact pear-shaped or round objects in which the individual cocoons or pupae are deeply and securely embedded. There are several generations each year, and the eggs, which usually develop after 2-5 days, are laid in the body of the host caterpillar. The larval stage lasts from 6-15 days, after which the whole brood in the gregarious species of *Apanteles* leave the host simultaneously spinning up in their characteristic cocoons, in which they remain for from 5-10 days.

(b) *Ichneumonidae*. This is a much larger family than the Braconidae with nearly 2,000 British species. Its species average larger in size and are much more standardised in morphological characters, though in diversity of habits they rival the Braconids. Because the hyperparasitic habit is strongly developed in certain sections of the family not all the species are beneficial. Whilst some are specific in their host preferences, many more have a wide range of hosts, and the classical example of catholic tastes in this respect is the abundant *Hemiteles areator* (Panz.), which has been bred from over a hundred hosts of several different orders, including members of its own family.

Ichneumons generally have an appreciably longer adult life than the Braconids, often living for as much as 6-8 weeks. Certain groups, chiefly Ichneumoninae and Cryptinae, are known to hibernate in the adult stage, and such species may live as long as ten months.

(c) *Cynipoidea*. This super-family comprises a single family, the Cynipidae, of only 228 British species, remarkable as including both plant feeding (gall-making) species and zoophagous or parasitic species. The sub-family Cynipinae includes the insects of the familiar Oak Apple, Marble gall, Spangle gall and numerous others, some of which are famous for their alternation of generations. It also includes the tribe Synergini, members of which are inquiline or lodgers in Cynipine galls. The remaining sub-families comprise the parasitic forms which are internal feeders in the immature stages of their respective hosts. Thus the Charipinae are hyperparasites of greenfly through their primary Braconid parasites. The Figitinae and Eucoilinae live in dipterous larvae, and the remarkable Ibalinae, with probably only a single British species, are parasites of the larvae of the horntails of the family Siricidae.

(d) *Chalcidoidea*. This huge super-family of nearly 1,600 British species includes 14 families in this country. They are small, often rich metallic green insects of great beauty and are systematically the most neglected of British insects. It would take a lifetime of specialised study to reduce our species to something approaching order as there are special difficulties in the taxonomic field. Yet nowhere are there better opportunities for workers, so great is the economic importance of many of the species. A very few species are plant feeders, but most are parasites, often secondary, of other insects, and these exhibit diverse habits of great interest. One of the included families is the remarkable group Mymaridae or Fairy flies, small, often minute, parasites of insect eggs.

(e) *Proctotrupoidea*. There are seven families included in this super-family of over 600 British species. They are small insects, usually black or dark brown in colour and are mostly internal primary parasites with relatively constant host preferences. The Ceraphrontidae alone appear to be secondary parasites, often of greenfly through Braconid primaries. The Scelionidae are egg parasites and the Platygastriidae are interesting for their polyembryonic development.

(f) *Table showing Classification of British Hymenoptera*. Categories in italics are entirely or largely parasitic. Numbers in brackets are totals of British species as included in the latest computation (Kloet and Hincks, 1945).

#### ORDER HYMENOPTERA (6,210).

Sub-order Symphyta. Sawflies and allies (432).

Sub-order Apocrita.

Section Parasitica.

Super-family *Ichneumonoidea*. (2,825).

Family *Trigonaliidae*. (1).

Family *Evaniidae*. Ensign flies (10).

Family *Braconidae*. Braconids (902).

Family *Agriotypidae*. (1).

Family *Ichneumonidae*. (1,928).

Super-family Cynipoidea. (228).

Family Cynipidae. Gall wasps.

Phytophaga. True Gall wasps.

Zoophaga. Parasitic Cynipids.

Super-family Chalcidoidea. Chalcids (1,564).

Super-family Proctotrupoidea. Proctotrupids (613).

Section Aculeata. (531).

Family Dryinidae. (38).

Family Bethyidae. (16).

Family Cleptidae. (2).

Family Chrysididae. Ruby-tailed wasps (21).

Family Tiphidae. (2).

Family Sapygidae. (2).

Family Methocidae. (1).

Family Myrmosidae. (1).

Family Mutillidae. (2).

Family Formicidae. Ants.

Family Pompilidae. Spider wasps.

Family Vespidae. Wasps.

Family Sphecidae. Wasps.

Family Apidae. Bees

#### 5. PARTHENOGENESIS.

Parthenogenesis, or reproduction without fertilisation, is a very common condition amongst the Hymenoptera. At one time it was thought that the progeny of parthenogenetic reproduction were always or, at least, usually males. It is now well known that this is not so, in fact Muesebeck (1927) records two common species of *Hemiteles*, hyperparasites bred from the same host, one of which is arrhenotokous (male-producing) and the other thelytokous (female-producing).

#### 6. POLYEMBRYONY.

Polyembryony is the term applied to the development of more than one individual from a single egg. It has been recorded in the Braconidae and the Chalcid family Encyrtidae, both of which develop in Lepidoptera. The classical example, referred to in most zoological textbooks, is the Proctotrupid family Platygasteridae, parasitising the dipterous family Cecidomyiidae. The polyembryonic Encyrtids and Platygasterids oviposit in the eggs of their hosts and develop in the host larva from which they emerge as adults. Some of the polyembryonic species develop parthenogenetically producing male individuals, and a few species appear to be capable of laying both fertilised and unfertilised eggs in the same host, which give rise to both sexes. The embryonic development of the eggs varies considerably in different species, resulting in widely different numbers of daughter nuclei and consequently in the number of embryos produced. Thus in *Macrocentrus* (Braconidae) numbers ranging from 16 to 24 have been recorded, whilst large numbers appear to be the rule in the case of the Encyrtids reaching a maximum of more than 3,000. The Platygasterids, because their hosts are small, appear to produce no more than 2 to 18 for each single egg laid.

#### 7. ADULT FEEDING HABITS.

Adult parasites often feed on nectar and may thus be collected on flowers, especially the flower-tables of the Umbelliferae. Others have evolved the curious and interesting habit of feeding at the oviposition puncture in the host, whose body-fluids escape from the aperture produced by the introduction of the egg. In certain instances where oviposition takes place in concealed hosts such as pupae in cocoons, etc., the parasite is able to construct a frail feeding tube connecting the hidden host with the surface on which it is standing. This feat is accomplished by the insect inserting her ovipositor through the cocoon, pupal skin, and into the body of the actual pupa. An egg may be deposited and afterwards a viscous fluid is secreted from the ovipositor, which quickly hardens and is moulded by movements of the ovipositor into a tube, receiving added fluid as the organ is gradually withdrawn. Ultimately a delicate tube reaches from the host tissues to the outer air whence the body fluids ooze when the ovipositor is completely withdrawn. The insect feeds on the escaping fluids and afterwards reinserts her ovipositor to demolish the tube so that the host shall not bleed to death and thus deprive the parasite grub of sustenance.



## II. THE COUNTRY LANE.

Perhaps we have taken rather a long time over the preliminaries, but we are at last ready for our short excursion, so let us pack a few tins, specimen tubes and a knife and set out for the country lane. Any country lane will serve our purpose and we are all able to recall to mind a favourite walk which will provide us with all the material we require. The lane I have in mind is composite—a combination of impressions of several where I have spent happy hours collecting. The surface is still rutted where the farm carts passed during the winter, but now it is dry, leaving mud mountains separated by valleys where the spring rains lingered a little. The two or three yards of verge on either side of the roadway is a tangled mass of brambles and dog-roses, with a fascinating assortment of herbaceous plants of the familiar kinds. Perhaps I shall be forgiven if my imaginary lane has seeding knapweeds, whilst the dog-roses are blooming and spring flowers vieing with brambles in attracting the bumble bees. Behind the verge on either side is a hedge of hawthorn, sloe, hazel and other bushes. Behind the hedge on one side there are pastures, whilst on the other there is a wind-break a few yards wide containing the usual trees, sycamore, oak, elm, beech, a few birch, an occasional holly and horse-chestnut. On this side between the hedge and the verge runs a small brook almost obscured in places by goosegrass, nettles, campion, woody nightshade, meadow-sweet and hogweed. In one spot it broadens, flowing rapidly over stones and shingle. Further along the lane on the opposite side, just through a gate, is a small pond bordered with reeds, reed-mace and patches of yellow flag. Here, then, is a veritable paradise for the entomologist who needs no more than a hundred yards of such country to have ample work for a whole day. Let us see what we can glean in this lane as we quietly and unhurriedly scrutinise the hedgerow.

### I. GALLS.

Here is a young oak which has pushed several of its low-spreading branches through and over the hedge. An amazing tree the oak, it supports a far larger insect population than any other plant. Houdard (1908) lists well over a hundred different galls on *Quercus robur*. Of course, they do not all occur on one tree, but sometimes a surprising number can be found on a single plant. There are several different kinds on our tree. There is the Marble, or Devonshire, gall known to everybody, and the Oak Apple, a larger kind looking more like a clean new potato than an apple when it is mature. There are masses of Spangle galls on the undersides of the leaves and the Yellow Pea gall on the veins. Besides these there are others on the leaves, twigs, bark and roots, but we have discovered enough for the moment. These galls are the response of the plant to the egg-laying activities of certain insects called gall-wasps or Cynipidae. Each species of gall-wasp causes a specific reaction in its host plant so that a gall characteristic of the particular species is formed. Many of the gall-wasps are easily named from the characteristics of their galls, but errors are sometimes made for reasons that we shall understand in a few minutes. The female gall-wasp (sometimes the only sex, reproduction being parthenogenetic) punctures the chosen part of the plant with her ovipositor and lays one or more eggs in the superficial tissues of the plant. It is not fully understood why the plant responds specifically to each different species, but it does so and shortly a gall develops around the egg or newly-hatched grub. At first green and soft, the gall later assumes its mature colouring of russet, gold, cherry-red, etc., and the larva, throughout the development of the gall, feeds on the abundant plant tissue thus placed at its disposal.

If we cut a mature Marble gall across with a penknife we shall see that the exposed surface consists of fibrous matter surrounding a small central cavity. This cavity contains a single curled fat cream-coloured grub. This is the larva of *Adleria (Cynips) kollari* (Hartig), the species of gall-wasp whose ovipositor set in motion the processes which resulted in the gall. The larva is in a land of plenty, surrounded on all sides by rich vegetable tissues. Yet the banquet is not wasted for here in the periphery of the gall we can now see several smaller grubs embedded in the tissues. These are the young stage of another gall-wasp, *Synergus*. The females of these insects do not stimulate the plant to produce galls, but lay their eggs in the developing galls produced by other species. Such insects are inquilines.

We have not yet exhausted the possibilities of the Marble galls. Besides the

true gall-wasp *Adleria* and several species of *Synergus* which will hatch out readily from any galls we keep over the winter, we shall find that others provide us with very different insects. Both *Adleria* and *Synergus* are parasitised by several species of the Chalcid genus *Torymus*, lovely bright metallic green insects with long female ovipositors which differ in length in the different species of the genus dependant upon their hosts. Nor are these all for there are hyperparasites and quite a host of hangers-on of various categories. A hundred years ago Francis Walker (1846, *Zoologist*, 4: 1454) bred from a quantity of Oak Apples the following insects: 9 species of Coleoptera in 191 specimens; 1 species Orthoptera, 5 specimens; Psocoptera, 2 species in hundreds; 4 or 5 species of Cynipidae, 30, 246 specimens; parasitic Hymenoptera, 45 species in 24,417 specimens; 3 species Diptera, 23 specimens; 5 species Lepidoptera, 9 specimens; Hemiptera, 5 species, 51 specimens; Arachnida, 5 or 6 specimens. His total 'bag' was 75 species in more than 55,000 examples.

We could easily repeat Walker's feat by keeping specimens of the Mossy or Bedeguar gall, sometimes called Robin's Pincushion, which is so common on the rose bushes of our lane. Of course, the gall-wasps, inquiline, parasites and hyperparasites will belong to entirely different species. Also the Bedeguar gall is multilocular and multilarval like the Oak Apple, whilst the Marble gall is unilocular and unilarval so the first will prove to produce an amazingly large population next spring.

By collecting and rearing the various galls we can find in the lane on different host plants we should accumulate a useful collection of parasites, but we must not linger or we shall not see all we set out to investigate.

## 2. GREENFLY PARASITES.

In examining the plants and trees we shall find many of them to be infested with Aphids (more correctly Aphidids), or Greenfly, as they are called. The wild roses, knapweeds, thistles, elderberry, sycamore and a host of others will provide distinct species of these widespread pests. We are sure to find individuals which are parasitised having a swollen, indurated appearance and differing in being darker coloured than normal as well as stationary upon the plant. These are examples inside which the parasitic larvae have reached nearly their maximum growth. In the earlier stages of parasitism the greenfly seems little inconvenienced by the grub which is feeding on its tissues, although its reproductive capacity is impaired. To commence at the beginning we should first note that the centre of the circle of parasites and hyperparasites which affect the Aphids is an interesting little group of insects called Aphidiinae, which is sometimes regarded as a separate family, but is perhaps more correctly placed as a sub-family of the Braconidae, from which it differs in wing-venation and habits. These parasites have a strong family likeness which once appreciated renders their recognition easy. The habits are closely similar throughout the group with the exception of certain details. The females search out greenfly quite early in the year, for in some species as many as eight generations have been recorded in a single season. The insect lays a single egg in the body of each aphid. This produces a larva which feeds on the contents of the host's body. In a few days the grub is full grown and slitting the belly of the greenfly it anchors the now empty skin securely with silk to the leaf on which it is resting. It then pupates within the aphid after padding the inside with silk threads. After a few days more the adult emerges by a circular exit hole in the dorsum of the aphid skin. It often leaves the lid hinged at one side so that it falls into place after the parasite has escaped. All the British genera of the group have a similar life history except *Praon* and *Dyscritulus*, which differ in detail in the manner of pupation. Species of the former leave the body of the greenfly as fully fed larvae by way of a hole in the venter of the host. They then spin a conical tent-like cocoon beneath with the empty skin firmly superimposed. In *Dyscritulus*, of which we have only a single definite British species, the cocoon is a charming disc-shaped or button-like object (Hincks, 1944).

*Asaphes vulgaris* Walk is one of the commonest Yorkshire insects, although it is not yet 'officially' on our lists. It is a Chalcid belonging to the family Pteromalidae and a very frequent hyperparasite of the aphids. It appears to parasitise any Aphidiid greenfly parasite irrespective of species, and, no doubt, it has very many other hosts, too. The little black and testaceous hyperparasites of the Charipinae (a sub-family of the Cynipidae or gall-wasps) are also always

plentiful and can be reared from almost any batch of greenfly having Aphidiid primary parasites. They have been recorded as so abundant in the little currant aphid (*Cryptomyzus ribis* (L.)) as to completely destroy the host *Aphidius ribis* Hal. Quite a number of species of the Proctotrupid family Ceraphrontidae are also hyperparasites of aphids and are again amongst the most neglected of our common insects.

Having collected some samples of parasitised greenfly for rearing purposes we must move on a little further.

### 3. CATERPILLAR PARASITES.

Here is a nettle bed and the leaves of the plant show ample signs of the activities of the caterpillars of the Small Tortoiseshell butterfly (*Aglais urticae* (L.)). The caterpillars are almost fully fed and will soon be searching for suitable quarters in which to pupate. This shrivelled, almost empty, skin, surrounded by sulphur yellow oval cocoons spun together with strands of silk, is an interesting though not unusual find. The cocoons are those of one of the group of Braconid primary parasites called the Microgastrinae. This group of insects should be familiar to everyone as most of its species are of the greatest assistance to us and one species, *Apanteles glomeratus* (L.), is a slayer of the caterpillars of those garden pests the Magpie moth and Cabbage butterflies. The female Braconid lays a number of eggs in the caterpillar and the hatching grubs devour the tissues of the unfortunate host slowly and methodically until, when they are almost full grown, it dies, a mere empty skin. The Braconid grubs emerge simultaneously from numerous holes which they pierce in the caterpillar's skin, and almost immediately spin their cocoons grouped round the dead host. At this stage the cocoons are often visited by Ichneumon flies, *Hemiteles* and *Mesochorus*, which lay a single egg in each of several. Chalcid and other parasites also attack the cocoons when they are not so protected as to discourage attention.

This simple type of parasitism is characteristic of the life history of many species of parasites and hyperparasites of the caterpillars of Lepidoptera and sawflies (Hymenoptera). There are innumerable variations of detail, indeed, our lane can reasonably be expected to supply several.

### 4. LEAF MINERS.

If we look carefully at the vegetation at the side of the lane we shall notice that there are leaf-mines on nearly every plant. We shall find them on trees and shrubs such as oak, elm, birch, roses and brambles, holly, honeysuckle, etc., as well as on herbaceous plants. These mines are the workings of the larvae of several distinct groups of insects and the characteristics of the mines, combined with the food-plant, are often specific. Sometimes they are blotches, sometimes long and ribbon-like, very narrow at first and gradually broadening to the end. Sometimes they are confined to the edge of the leaf, others meander across the lamina, some being straight whilst others are coiled. Some can be seen from either surface of the leaf, others on the upper or under side only. The principal leaf-miners are several families of small moths belonging to the so-called 'Micro-Lepidoptera,' and the entire family of flies called Agromyzidae, little insects looking like diminutive house-flies and so unworked in this country that only about 80 species have been recorded whilst at least a hundred more could be added by the first serious worker. Certain other Diptera are also leaf-miners such as the well-known Celery fly (*Philophylla heraclei* (L.)), some midges of the family Cecidomyiidae, and a few Muscidae. Several very interesting sawflies and a few species of beetles have adopted the same habit. An egg is laid under the epidermis of a leaf of the appropriate food-plant or it is sometimes glued to the outside of the leaf so that the first bite of the emerging larva opens up the epidermal layer. The larva feeds upon the abundant food beneath the epidermis, adopting a method of work appropriate to its kind—penetrating one or more layers, severing or not the veins of the leaf in its path, going in this direction or that. As it grows and moults it enlarges its home and deals with the question of sewerage disposal also in a specific manner; so much so that the frass or rejectamenta provides important characters for determining the miner. Some species complete their feeding in one mine, others emerge and start a new mine elsewhere. When fully grown many pupate in their mines, others, as is the case with the moths *Coleophora*, pupate externally in little cases, whilst some species leave the plant and pupate in the soil. In all situations the larvae and pupae provide excellent hosts for



innumerable parasites and hyperparasites, though little has yet been done in this country to study them except from specimens caught in the field by ordinary collecting methods.

It is quite difficult to find a holly tree that is not attacked by the Holly leaf-miner (*Phytomyza ilicis* Curtis). Its characteristic blotches are only too common everywhere. It is interesting to know that in recent years ornamental hollies have been attacked by introduced Holly leaf-miners in British Columbia, and in order to examine the possibility of biological control the fly and its parasites have been carefully studied in this country by Cameron (1939). This worker bred nine species of parasites consisting of five species of the Chalcid family Eulophidae and three belonging to the Pteromalidae, together with a single Braconid.

These particular mines are probably best collected in the month of February, so let us make a note to visit the lane again at that 'dead' season. In the meanwhile there are plenty of other mines which we can collect for rearing purposes.

#### 5. THE POND.

Let us turn our attention to the pond for a few minutes. There is something very attractive about pond-life. Perhaps it is the limited fauna and flora, the strictly circumscribed habitat and the ecological implications that produce an appeal to the biologist, hard to resist. Our contact with this special environment will be a meagre one and we must resist the temptations to digression which the many interesting life-forms present. On the surface of the pond in the patches of open water not populated with *Potamogeton*, etc., there will be seen glistening giddy little blue-black beetles which gyrate about in a fascinating manner. These are Whirligigs (*Gyrinus* spp.) whose aquatic larvae live in the depths of the pond. On reaching maturity these larvae emerge and mount the littoral reeds to a height of two or three feet, and there build their characteristic cocoons, which remind one rather of splashes of dried mud. We can find these cocoons in numbers and removing them with their basal piece of leaf bring them home for rearing. Next spring we shall find that many whirligigs emerge and also a greater or lesser number of parasites and hyperparasites. As long ago as 1881, the Rev. J. Hellins (*Ent. Mon. Mag.* 18 : 88) reared two or three species of the Cryptine Ichneumonid genus *Hemiteles* from these cocoons, together with a Pteromalid hyperparasite. In North America similar but different parasites attack the species of *Gyrinus* which occur there. I have myself bred one of our whirligig parasites *Ischnurgops (Hemiteles) argentatus* (Grav.) from East Riding material sent me by the late T. Stainforth, and also numerous specimens of the Pteromalid hyperparasite.

The small Damoiselle dragonflies which flit round the borders of the pond remind us that their eggs, scattered singly on the mud at the bottom are often parasitised by members of a most interesting and remarkable group of Parasitica. The Mymaridae or Fairy-flies are well known at least by name on account of the work of Fred Enock at the end of the last century. Enock was singularly proficient at catching these minute insects and employed many of them for the purpose of making very pretty microslides which used to be prized by the old school of amateur microscopist. Often no more than a fraction of a millimeter in length (the smallest being 0.21 mm.) these minute Chalcids frequently have long and narrow wings beautifully fringed with long hairs. We have 52 species in this country and several may readily be collected with a sweeping net amongst rank vegetation, but it is not quite so easy to see them in the net or to transfer them to a tube. All the species are parasites of the eggs of insects belonging to six different orders. Species of the genera *Anagrus* and *Caraphractus* enter the water for the purpose of ovipositing. In 1919 (*Naturalist*, 151), Mr. Cheetham published an interesting note and illustration of our Yorkshire *Caraphractus cinctus* Walker (*Polynema natans* Lubbock), which parasitises dragonfly eggs. The same species is figured and discussed in Miall's *Natural History of Aquatic Insects*, 1895 : 219, 220, f. 78, and an interesting paper has been published by my friend Mr. H. Britten entitled '*Caraphractus cinctus* Hal. in Manchester in 1918' (*Lanc. and Ches. Nat.*, 1919 : 47-51).

These aquatic Mymarids share the habit with the quaint little swimming Trichogrammatid *Prestwichia aquatica* Lubbock, of which as many as fifty individuals may sometimes develop from a single *Dytiscus* egg. It is interesting to note that the sex ratio in this species is one male to twenty females and that mating has been proved to take place in the host egg before emergence.



## 6. THE STREAM.

If we now leave the pond and crossing the lane examine the stream where it flows swiftly over the submerged stones, we are sure to discover, on the surface of these stones, the cases of the common caddisfly, *Silo pallipes* (F.). Some of the cases, if we are fortunate, and if our visit is between September and April, will show the characteristic respiratory ribbon of the interesting parasite *Agriotypus armatus* Curtis, the sole exponent of the family Agriotypidae in Europe. Mr. H. Whitehead has recently (*Naturalist*, 1945 : 123-5) given a good account of this insect so that there is no need to say more about it here than that it would be a pity not to search out this little known insect for ourselves now that its habits have been so clearly described to us.

A careful examination of the stream-side vegetation is sure to reveal the egg-masses of a very common insect, the Alder-fly, *Sialis lutaria* (L.). These are not infrequently parasitised by an atom with a disproportionate name, *Trichogramma evanescens* Westw. *Trichogramma* parasitises the eggs of many hosts, but those of *Sialis* are usually the easiest to find. The parasite belongs to the Chalcid family Trichogrammatidae. It is a very small insect about three-tenths of a millimeter in length and like all the members of its family is a primary internal parasite of the eggs of many different insects. In fact more than 150 hosts have been recorded belonging to seven different insect orders. The following partial list is after Sweetman (1936) :

Order.	Number of families parasitised.		Number of species parasitised.
Coleoptera ...	...	1	2
Lepidoptera ...	...	15	45
Hymenoptera ...	...	4	6
Neuroptera ...	...	2	3
Diptera ...	...	1	7

If we collect some of the batches of *Sialis* eggs and put them into small tubes we are almost certain to find that some of them contain *Trichogramma*. The adults bite a hole in the chorion of the egg, and females emerging may sometimes oviposit the same day if suitable eggs are available. They feed at the oviposition puncture on exuding fluids. It has been stated that eggs in any stage of embryonic development are acceptable to the parasites and that oviposition inhibits any further growth of the egg. It is interesting to note that this species is dimorphic in the male. Wingless males develop in certain hosts such as *Sialis*, whilst winged ones of a different type are produced from eggs such as those of grain moths. The life cycle is very short lasting only about 7-10 days in summer. There are thus many generations each season if host eggs are available and conditions of temperature and humidity are favourable. Sometimes this species develops parthenogenetically.

And now, although we have explored no more than a few yards of the lane and have left so many interesting parasitic forms undiscovered, I am afraid we must turn for home. The sun still gilds the tops of the taller trees, but the hedge at one side of the lane already casts a deepening shadow warning us of the fleeting hours. As we retrace our steps may I briefly explain how the facts we have observed link up with the seemingly irrelevant statement which I made at the opening of this address.

The destruction of the noxious *Opuntia* is just one aspect of what is known as 'biological control'—the control exercised by one organism over another at man's behest. In the case of the *Opuntia* it was the control of a pest plant by insects. A much more usual form is the reduction of insect pests by parasitic insects. But this is a story in its own right, and two simple illustrations must suffice.

A few years ago a little Chalcid parasite was discovered at Elstree parasitising cucumber whitefly. The parasitised 'scales' were sent to Cheshunt Experimental Station, where they were reared, and the Eulophid parasite, *Encarsia formosa* Gahan, was tried experimentally for the control of the tomato whitefly (*Trialeurodes vaporariorum* (Westw.)). The experiment was so successful that the use of this parasite has superseded the old method of hydrocyanic gas fumigation. An effective, rapid and cheap form of control against this whitefly is now available to all those with greenhouses.

Everyone knows the unsightly and destructive American Blight (*Eriosoma lanigerum* (Hausm.)) of our apple trees. In America another little Chalcid of the family Eulophidae, *Aphelinus mali* (Haldeman), exerts a useful measure of control. A few years ago this insect was introduced from America in an effort to control the pest. It was thought not to have become established in our country, but some of you may remember that a minor high-spot of the news during the summer was the recovery of this valuable insect in several separate localities, which suggested that it had not only established itself but was already advancing upon the enemy.

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## THE EYEBRIGHTS OF RHUM

H. W. PUGSLEY, B.A.

In *The Naturalist* for April-June, 1945 (No. 813), a paper of mine appears on the Eyebrights of Rhum, in the Inner Hebrides, collected by Professor J. W. Heslop Harrison in 1943. This was based on material, partly examined, which I took with me when leaving home unexpectedly through war conditions in February, 1944. On recently returning to Wimbeldon I found that I had omitted to mention about thirty further gatherings which I had examined and left behind as needing no further criticism. These gatherings include no novelties for Rhum, but they furnish additional stations in the island for *Euphrasia micrantha*, *E. scotica* and var. *purpurascens*, *E. frigida* var. *laxa*, *E. curta* vars. *piccola* and *Ostenfeldii*, and *E. confusa* f. *albida*. In addition they include three gatherings of *E. foulaensis* and two of *E. brevipila*, not mentioned in my paper but already recorded for Rhum by Professor Heslop Harrison (*Proc. Durham Phil. Soc.*, X, Pt. 2, 110); also further specimens of two of the new species described in my paper, viz.: *E. eurycarpa* (from Sandy Corrie and Ruinsival) and *E. rhumica* var. *fionchrensis* (from Mullach Mor). Professor Heslop Harrison's set of *Euphrasiae* from Rhum for 1943 thus comprises in all just over sixty gatherings.

Another small parcel subsequently received contains *E. rhumica* from turf near the sea at Monadh Dubh, in Rhum, and a form of *E. frigida* near the typical species from limestone rocks in the same district. These were collected by Mr. R. B. Cooke.

With the specimens from Rhum is a gathering from Loch Eynort, South Uist, in the Outer Hebrides, which I am unable to separate from *E. condensata* Jord. (*E. stricta* Host. non H. & B.). It shows similar aristately-toothed foliage, large lilac corollas, and narrow, scarcely truncated capsules. There is much large-flowered *E. nemorosa* in the Outer Hebrides, and some of this may not have been distinguished from *E. condensata*. It is desirable that further material should be carefully collected.

## NOTES ON THE BARBASTELLE BAT

ADAM GORDON

PRIOR to 1911, the year of the publication of *A History of British Mammals*, by Barrett-Hamilton, the range of the Barbastelle (*Barbastella barbastellus* (Schreber)) in Britain was believed to be confined mainly to the southern counties from Kent to Cornwall, with a few records from the Midlands and a very few from the northern counties of England. The latter related to a male in the British Museum, labelled 'Cheshire,' but without further data, and two examples captured near Carlisle. These were the only known examples from the north of England.

In August, 1920, a worn female example was captured by some boys near Helmsley, and came into the writer's possession (*Naturalist*, 1920, p. 279). In July of the following year, in company with the late H. B. Booth and others, it was decided to explore the ruins of Helmsley Castle. The search for bats at first yielded only a few Pipistrelles, until a recess at the end of a large room on the ground level was examined and here a large number of Barbastelles were clustered in two masses, like swarms of bees. From the distance of a few yards and by the dim light of a candle, they appeared to be sleeping, but actually they were very wide awake, for, on a closer approach, both masses took wing so suddenly that they appeared to explode, and actually put out the candle. On this occasion a few of both sexes were netted (*Naturalist*, 1921, p. 331).

Not long afterwards the Castle was taken over by the Board of Works, cracks were filled up and windows glazed. The bats did not desert the district, but found shelter in the roofs of some of the old houses in Helmsley, and from time to time examples have been found by workmen, usually under the tiles of houses, so there appears to be little doubt that it is well established in the area.

There is also the possibility that its range is extending, as in November, 1934, Mr. E. Wilfred Taylor obtained a female from Castle Howard, some ten miles distant (*Naturalist*, 1935, p. 3). This specimen was presented to the British Museum and was then the most northerly example in that collection.

It should be noted that both the Helmsley and Castle Howard districts possess an abundance of old timber and suitable hunting conditions for this species and that similar conditions prevail elsewhere in the county.

The writer has not found this species in hollow trees, nor at a great distance from its sleeping quarters. At dark it comes out to feed, returning in an hour or so to rest before undertaking a second flight before dawn. Its flight is somewhat slow and deliberate, lacking the speed and dash of the long-eared bat; it appears to like roads and will fly up and down on a regular beat in the same manner as the Pipistrelle, a habit which leads to its being killed by motor cars on occasions. Like the long-eared bat, it feeds on the larger moths and carries its prey to a shed or outbuilding. This habit often gives its presence away, as the wings of the victims fall to the ground. One such retreat is in a coalhouse near Helmsley with access through an open window. This summer (1945) an effort was made to obtain one or two specimens for the Yorkshire Museum, and a cautious approach to the window was made after dark. On flashing a torch on the favourite corner, two Barbastelles were surprised, clinging to the wall near the ceiling. One appeared to be feeding as its head was tucked underneath and the wings were fully open. Both bats at once took flight and there was a momentary glimpse of something light in colour falling to the ground. After the bats had been netted, the light coloured object was examined and found to be the body of a male ghost moth (*Hepialus humuli*) with two of the wings torn off. It is remarkable that a bat, not much larger than the long-eared, and with a smaller mouth, should prey on so large an insect.

In captivity it has not been observed to feed, perhaps because what was offered was not suitable, or because the experiment was made in the late summer when the animals were fat and replete in preparation for the winter sleep.

It is difficult to understand why this bat should be so local in Yorkshire, and possibly its presence in other areas has been overlooked. It is one of the easiest to identify as the fur is long and silky, of a deep black tipped with white, changing to white or light grey on the underside. The ears are set very close together and almost encircle the face, giving the head a somewhat small appearance.

It is to be hoped that those interested will keep a look out for the Barbastelle in other districts.

## THE SPREAD OF *OROBANCHE MINOR* SM. AT SHIPLEY

A. MALINS SMITH, M.A.

IN 1937 the lesser Broomrape was found on a new site at Shipley, Yorks., growing as usual on common Red Clover (Smith, *Nat.*, 1937, p. 209). It has now been under observation on this site for nine years and certain interesting points as to its relation to the host plant and its general spread have arisen which I propose to set forth in what follows.

The most striking feature of the life of any parasite is the balance which is maintained between it and the host plant. If the parasite is too vigorous and kills out the host plant, then the life of the parasite, too, terminates, and future existence in the locality depends upon successful attack upon new host plants. This may occur in two ways, either by the spread of seed, or by vegetative means. Since there are no means of vegetative spread above ground in *Orobanche*, such spread, if it occurs, must be by underground parts. Fig. 1 shows the central shaded area within which (approximately) all the 120 plants of 1937 grew, and the dots give the positions of the plants of 1945. It will be seen at once that the majority of these are outside the original area, although a few plants are still growing within it. The diagram, however, does not convey the great difference between the size of the plants outside the original area of 1937 and those growing within. This is most strikingly shown by the contrast between the single plant to the S.S.E., which attained a height of 18½ in., and that of the plant in the centre of the old area which was 3 in. high. These were extreme examples, the largest and the smallest, but no one could fail to be struck by the very much smaller average size of the plants within the original area as compared with that of the plants outside the area.

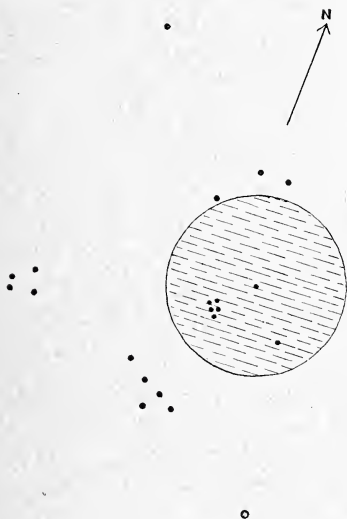


Fig. 1. Positions of Broomrape plants on the Shipley site. Diameter of shaded area represents 6 ft.

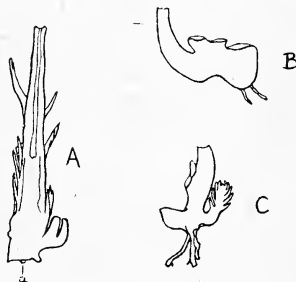


Fig. 2. Broomrape plants showing vegetative growth below ground. a=Attachment to clover root.

In 1937 the clover of the original area was composed of numerous large plants. In 1945 it was difficult to see any clover in this area. Only when one searched for the plants to which the few small Broomrapes here were attached did one succeed in finding a few very small clover plants on which these Broomrapes were just managing to survive. To the casual eye the area grows now only Wall Hawkweed and various grasses. Thus it may be broadly said that the Broomrape kills out its host plant and has to rely for its future existence upon its attack on new and vigorous clover plants outside the original area.

Investigation of the underground parts on July 31st, 1945, revealed the fact



that occasionally a Broomrape had advanced by vegetative means. Fig. 2A shows a plant with a new stem attached laterally to the old stem and Fig. 2B shows one which had continued to grow in this way until the stem of 1945 was the fourth in succession. Such plants were in a minority, however, the majority showing no sign of previous growth. In the plants which show a succession of stem bases, each stem normally represents the growth of one year, though exceptionally two may appear in the same period. In both specimens figured the advance made by this vegetative method averaged 5 mm. per stem, and thus in the nine years since their first appearance this method, if continued at the normal rate, would allow of  $4\frac{1}{2}$  cm. spread. It will be seen that, even allowing for the original area having been somewhat larger than my approximate estimate and for a somewhat more rapid advance made by larger plants, or by the growth of two stems in one year, this method is quite inadequate to account for the appearance of plants which are 4 to 5 ft. beyond the outskirts of the area originally occupied. Furthermore, this method does not allow of attack on new clover plants, for the original attachment to the clover root is relied on all the time and thus this method can only occur when a vigorous clover plant manages to survive the attack of the parasite for two or more years in succession. Both from the small number of Broomrape plants found attached to stem bases of previous years and from the very few and small surviving clover plants in the original area, it is evidently very unusual for a host plant to survive long enough to nourish the growth of the parasite for four years. The plant of Fig. 2B is unusual in that it has a bud for next year on it, so that five stems in all are included here. Fig. 2C is a view showing the new bud. It must be that this parasitic plant has struck an unusually stable balance with its host, a balance which is evidently precarious and seldom achieved and is dependent on the parasitic attack being limited enough to allow the growth of the host to continue on a moderate scale year after year. Thus, from the inadequacy of the vegetative method of growth to account for the observed spread of the parasite on account of its very slow rate and its failure to attack new hosts, it is clear that the effective method of spread is by seed. Even if this were not clear from the previous records, it was made certain by a new observation on July 11th, 1945, when a new group of plants not shown in Fig. 1 was found approximately 24 yds. away from the centre of the original area. This distance is, of course, quite out of the range of any vegetative method of spread.

With regard to the method of spread by seeds, the facts are that sound seed is freely produced, that the seeds are minute\*, and thus are capable of wide and easy wind dispersal, and that the host plant is abundant in the locality. The general method of seed germination, attachment to host roots and growth to a swollen tuber before flowering is familiar, but as I pointed out in my first paper, the length of time taken by this process is unknown, nor is it known how long the seed may lie dormant in the soil. The absence of any plants in the three years 1940, 41 and 42 must mean that the total duration of dormancy and germination can be at least four years†, and this on the assumption that it was seeds of 1939 which produced the plants of 1943, and it is possible that they may have grown from seeds of earlier years.

It is perhaps unlikely that such minute seeds containing little food reserves can survive long in a dormant condition and it would follow that the four-year period was occupied almost entirely by germination, but the whole matter is vague. As, however, it seems certain that spread by seed is the only possible method, there would be an expectation of finding in the soil the tubers in the early stages of germination. This is, however, a difficult search, as these stages from such minute seeds must be very small in late summer when all those of sufficient size have already produced flowering stems. I have found only one structure which could be interpreted as a tuber, and this is suggestive of the possibility of finding more at a more favourable time, say early June, if a careful and laborious search were made. At present this aspect of the matter must be left uncertain. About six or seven years ago I scattered seeds in a new locality where there was plenty of clover, but no Broomrape has sprung up there so far.

\* A sample was spread out evenly on paper and counted. The number was approximately 29,000 seeds. These weighed .0808 grams. This gives ten million to the ounce.

† Logically there is another alternative, namely, that all the plants of the period 1937-45 have arisen from the same unknown source as the 120 or so of the original outburst of 1937, but this seems unlikely.

One or two further points may be added. I have never seen any insects visit the flowers of this Broomrape and, as far as I can detect, the flowers have no scent. The ovaries swell regularly and, as is usual in the absence of frequent insect visits, such regular seed formation can only take place by self-pollination, and I think self-pollination is the regular thing here. The ovary splits open along two vertical lines posterior and anterior. The ripe ovary is surrounded by the faded corolla and the whole arrangement forms a censer mechanism. There is slight protogyny but the stigma and anthers are ripe together for a considerable time.

The only fact which tells against the conclusion that the plant is spreading by seed is that the direction of spread is opposite to that of the prevailing wind. Although there is plenty of clover to the leeward side there has been no spread at all in this direction. There must be plenty of opportunities for spread in the direction opposed to the prevailing wind. Not only does the wind sometimes blow in different directions from the usual, but the site is specially protected to the windward by the slope of the ground and by a group of trees, so that local eddies of air in a direction opposed to the normal are almost certain to occur. It is, however, surprising that no spread at all has been made in the direction of the prevailing winds and this fact can only at present be attributed to coincidence. It can confidently be expected that future years will show spread in that direction also.

## THE ICE AGE

H. C. VERSEY

THE Ice Age has long been a favourite subject of geological research in this country, but it has been regarded merely as a short 'climatic accident' at the end of the Tertiary Era. In consequence stress was placed on the physical and climatic conditions of the period, the directions of ice-movement and the physiographic effects on the landscape. No serious attempts were made to apply stratigraphical criteria to the deposits and a prevailing monoglacialisist viewpoint rendered this largely unnecessary. The last two decades have seen a reorientation of glacial studies, the monoglacialisist theory is now accepted by very few workers and thus it becomes important to attempt an accurate dating of the various deposits. The marginal position of the British Isles to the centres of European glaciation makes it difficult to establish a complete chronology from British evidence. It is opportune, therefore, that Dr. Zeuner\* should have assembled much of the evidence from five continents, offered a general chronology and attempted an astronomical explanation of the climatic sequence.

The Pleistocene period was so short that normal palaeontological dating methods are not applicable and the student must rely on those lines of evidence which indicate the changes of climate, *i.e.* the alternations of glacial and warm episodes. Dr. Zeuner therefore emphasises details of the lithology of the deposits which receive relatively little notice in the stratigraphy of older periods. Such phenomena as moraines, loess, soil-flow and polygon soils are regarded as proof of a cold climate while soils due to chemical weathering such as podsoles, brown earths and chernozems show milder conditions. Outside the glaciated areas, the successive terraces of the major rivers and variations in the position of sea level provide important data, but it is necessary to relate these to a climatic sequence which can sometimes be done by reference to the presence of climatically significant fossils such as the elephants and rhinoceroses.

It is impossible to summarise the details of successions given by the author from localities all over Europe or even to discuss the basis of his selection. He disarms any criticism on the latter ground by suggesting that any section which gives no certain clue to its age is useless for compiling a chronology. For this reason all North of England localities are neglected although the author has to use the Scottish re-advance to support his correlation between British and German glaciations. It may be that Yorkshire Drifts have not as yet contributed reliable additions to the sequence of phases established in East Anglia, but further research on the lines of that carried out by Bisat and others may serve to test the value of the supposed breaks in East Anglia.

\* The Pleistocene Period : Its Climate, Chronology and Faunal Successions. Ray Society Publications No. 130, London, 1945.

Dr. Zeuner adopts a sub-division into four main glaciations each of which is further sub-divided into two or three cold phases so that the whole of the Pleistocene is made up of nine glacial episodes of varying length separated by interglacial (or interstadial if minor), *i.e.* warmer phases. He appears to regard the four main glaciations as equivalent to the well-known Günz, Mindel, Riss and Würm glaciations which Penck and Bruckner established forty years ago. It may be suggested that these names might have been retained and given a chronological connotation rather than introduce such terms as 'Antepenultimate Glaciation' or 'Penultimate Interglacial' which are very clumsy and which are not rendered easier to use by adopting the suggested abbreviations such as ApG<sub>1</sub> or Plg<sub>1</sub>.

Outside the glaciated areas, the glacial cycles are replaced by pluvial cycles and in the Mediterranean regions, the author, using evidence from caves, from soil types and from fossils suggests a correlation with the later part of the succession in Northern Europe. The relation of glaciation of variation in sea level is discussed in Chapter IX where Dr. Zeuner collects evidence for the world-wide occurrence of certain ancient sea-levels at remarkable uniform distances above present sea-level. These occur at approximately 8, 18, 32, 60 and 100 metres, the first three of which may be due to the holding of water on the land as thick ice-caps and its subsequent melting. The author regards these three levels as belonging to the interglacial periods. There is yet insufficient data for absolute dating, but it is reasonable to expect that further research will enable a clear connection to be established between the raised beaches, the river terraces and the main glacial succession. Teleconnection between beaches on opposite sides of an ocean is still merely a speculation and will be until it is certain that no beaches or erosion platforms have been overlooked in any one coast and tectonic movements have been allowed for.

The cause of the Ice Age still puzzles geologists, and it is interesting to read that Dr. Zeuner returns to the old theory of the astronomical control of climate which was popular seventy years ago but with this difference, that while last century the theory applied to the single Ice Age, Dr. Zeuner regards the alternations of hot and cold periods as definitely related to the regular perturbations of the earth's orbit. Each perturbation such as variation in the obliquity of the ecliptic or the eccentricity or the precession of the equinoxes has a known period and must have some effect on the length of the seasons and on the annual range of temperature. From known data, Milankovitch has deduced the variation in solar radiation reaching the earth during the period extending back a million years. Dr. Zeuner considers that the spacing of the periods of solar minimum agrees well with the geologically deduced intervals between the glacial episodes. The whole argument is plausible, but it must be remembered that climatologists are not agreed that the temperature variations brought about by the perturbations are so pronounced as Milankovitch supposes. The latter's calculations refer to a uniform earth and the effects discussed may be masked by the definite climatic effects of changes in the height of land and in the amount of land and sea. It is quite certain that a very small lowering of the snow line to-day would extend the area of permanent snow by a considerable amount and such an extended snowfield tends to increase in size by the production of an anticyclone and by loss of heat through reflection. Naturally these effects would be intensified by elevation of the land.

As Dr. Zeuner is careful to point out, the astronomical variations cannot explain the Ice Age as a whole which must be due to some cause transcending relatively minor perturbations.

The volume is timely and useful. It is hardly suitable as a textbook, but will undoubtedly be in great demand as a work of reference. A valuable bibliography and extensive index add to its value.

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### PRIESTLEY MEMORIAL FUND

DONATIONS to the Appeal Fund launched in memory of the late Professor J. H. Priestley amounted to £790. The money is being held in trust by the Council of the Leeds University and the income will be used as a grant to students of merit for field studies, visits to other institutions, or other approved means of assistance in their botanical work.



## NESTING OF THE WOOD-LARK IN NORTH YORKSHIRE

E. M. RUTTER

A PAIR of Wood-Larks (*Lullula a. arborea*, (L.)), was first seen by me on March 30th, 1945, on an area of heathy ground recently planted with young conifers about 2 ft. high in an area of woodland in the southern part of the North Riding of Yorkshire. Some acres of tall oak trees adjoin the site on one side.

The weather was bright and cold with a westerly gale blowing, making observation difficult. I noticed a pair of birds rise from the ground at a distance of about 30 yds. and at first took them for Skylarks. I then noticed that they appeared to have short tails. Being familiar with the Wood-Lark in west Somerset I concentrated my attention on them, and as one of the birds soared the short tail was very evident. The song was inaudible owing to the high wind. This also interfered with observation on the ground, but I was able to see the eye-stripe through glasses.

The site was revisited on April 2nd with R. Wagstaffe, Keeper of the Yorkshire Museum, who confirmed my identification. On this occasion the song was distinctly heard.

On April 28th, together with E. W. Taylor, a careful search was made for the nest. The weather was most unfavourable, with showers of hail and rain, and we failed to find the nest. We did, however, pick up an empty egg-shell which was definitely a Wood-Lark's and one of the birds was seen to be carrying food.

On June 10th, the two adult birds were seen first, and later three young birds fully grown keeping themselves apart from the adults, giving clear evidence that breeding had taken place.

I have not been able to hear of any previous case of the Wood-Lark breeding in Yorkshire which has been clearly authenticated. Such a record is not included by Nelson in *Birds of Yorkshire*, although he gives instances of occurrences in several localities in the county.

### REVIEWS AND BOOK NOTICES

**Stories from a Bird Watcher's Log**, by W. W. Nicholas, F.R.P.S. Pp. 262, with over 50 photographic illustrations. Clegg & Son, Bradford, 12/6. Mr. Nicholas, a well-known member of the Yorkshire Naturalists' Union, incorporates in a very pleasing volume many reminiscences of his adventures in bird-watching and bird photography. The author knows his subject well; he is an enthusiast, and it is therefore not surprising to find that all he says is of absorbing interest not only to fellow ornithologists, but to the youngster who is perhaps half drawn to this branch of natural history. It is men like Mr. Nicholas who give the greatest encouragement to the beginners. He has an easy style and soon makes a friend of the reader who, in imagination, may accompany the author on his exciting expeditions. The photographs are all excellent, and fit the text admirably. This is a splendid present for a keen young naturalist.

**How to Study Birds**, by Stuart Smith. Pp. 192, with 20 illustrations made up of photographs by the author, Eric Hosking and A. G. Britten, and diagrams and sketches by Edward Bradbury. Collins, 8/6. It is a great pleasure to write about this book. Dr. Smith has been a keen ornithologist from early boyhood when he came under the influence of the late Richard Kearton. Now, although he is still a comparatively young man, he has turned out one of the best guides to ornithology we have ever seen. Here the beginner will soon realize that bird study ranges over an enormously larger field than the identification of species and sub-species and the spotting of rarities. The serious student must turn his thoughts to the consideration of such questions as migration, territory in bird life, the mechanism of flight, bird vision, food, songs and cries, etc.; etc. Up to now, reliable guidance in these and similar matters had to be sought in expensive manuals, and articles in scientific journals. Dr. Smith gives an intelligent reader a really sound foundation on which to build up his studies. A fair test of the excellence of this work is the chapter entitled 'A bird in the air.' Here in eighteen pages, in crystal-clear language, the student will find his ideas on bird-flight put in order. The illustrations throughout are excellent and, as may be imagined, entirely relevant. The pity of it is that owing to paper shortage, not every would-be purchaser will secure his copy. It is to be hoped that the publishers will find it possible to put out another edition very soon.

## NOTES ON A SOUTH NORTHUMBERLAND ROOKERY

C. J. GENT

THE rookery under notice is situated in two small woods north of South Gosforth about three miles from the centre of Newcastle-upon-Tyne. The two wood, (subsequently referred to as 'A' and 'B') lie on the western bank of the Ouseburn, and are separated by a small area of allotments. The plantation on the eastern bank of the stream was cut in 1925, and now consists of low scrub. To the east and north is a golf course, and on the west a housing estate consisting of semi-detached houses with gardens, built in 1924; to the south are allotments and a market garden.

The two woods consist of approximately equal numbers of oak and ash, with a few elm and one or two birch.

A pair of Rooks (*Corvus f. frugilegus*) twice attempted to build in the southernmost wood (B) in 1924, but both nests were destroyed: according to local information Rooks had never previously nested in the wood. In 1928 nests were again built in wood 'B,' since when the rookery has progressed as shewn below:

Year.	Wood 'A.'	Wood 'B.'
1928	...	33 nests
1929	...	38 "
1930	3 nests	33 "
1931	4 "	34 "
1932	3 "	24 "
1933	—	21 "
1934	2 "	20 "
1935	—	6 "
1936	—	4 "
1937	2 "	4 "
1938	—	4 "
1939	6 "	4 "
1940	8 "	6 "
1941	19 "	8 "
1942	18 "	9 "
1943	14 "	5 "
1944	58 "	7 "
1945	54 "	5 "

As a rule the nests were all in ash trees, only odd ones being built in oaks.

The young birds were shot in 1928 and 1929, since when they have not been interfered with.

In 1935 the local council dumped refuse in wood 'B,' which smouldered as a result of spontaneous combustion and killed many of the trees: this was responsible for the decline in the strength of the rookery to six nests (only five of which were occupied).

During the winter months the birds from this rookery fly to the Kirkley Hall roost as described by W. R. Phillipson (*British Birds*, XXVII, p. 66), and do not commence to roost in the rookery until the beginning of the third week in March. They cease roosting in the rookery towards the end of May, apparently as soon as the young are fledged.

**The Blackbird**, by A. F. C. Hillstead. Pp. 104, with 19 photographic illustrations. Faber & Faber, 8/6. This is a beautifully illustrated but curiously disappointing book. Although a very large number of observations on blackbirds are carefully recorded, these are mainly of the kind which, when arranged in some sequence, reveal the ordinarily observed phenomena of the day-by-day life of the species. A chapter on 'A day in the life of a male blackbird' promised to be interesting, but the author's three assistants appear to have been lacking in their co-operation, and the day's work was therefore scarcely worth recording in a published book. The scheme of employing four hidden watchers to make observations on an individual bird throughout a substantial part of a day is an excellent one, and capable of providing much useful material. It is rather a pity that the experiment was not repeated with a reliable team. It is to be hoped that the author will continue his observations and that a revised edition of this book will be written.

## In Memoriam

W. J. CLARKE, F.Z.S.

(1871-1945)

THE death, on October 22nd, of William James Clarke in a nursing home in Scarborough at the age of 74 removes a naturalist of more than local reputation from our midst, and one of the founders in 1890 of the Scarborough Field Naturalists' Society.

His father was the founder of Messrs. Clarke's Aerated Water & Bottling Co., Ltd., but after being educated at Wheatons Grammar School, Mr. Clarke served his apprenticeship at Messrs. Theakstons, St. Nicholas Street, the publishers of the *Scarborough Gazette and List of Visitors*. From early youth he was a lover of natural history, and he alarmed his master by taking frogs, toads and grass snakes in his pockets to business. Later in life for many years he kept and carefully recorded the habits of two large snakes, a python and a boa-constrictor, which he always said got to know him.

He commenced business on his own account in Huntress Row as a taxidermist and dealer in natural history requisites. On the death of his father he gave up the shop but continued his work as a bird lover, fisherman, and writer for various scientific journals.



He was an outstanding member of the Field Naturalists' Society and the Philosophical and Archaeological Society and was always prepared and willing to give lectures on natural history subjects beautifully illustrated with lantern slides, which at first were prepared and coloured by his mother. He would spend hours photographing birds, and if not successful, would calmly proceed all over again. By nature a kindly disposed and lovable character, he was always willing to help and would spend hours in order to make his subject entertaining, popular but always educational.

Mr. Clarke joined the Yorkshire Naturalists' Union in 1892, and was the second oldest member. As official Recorder for the Vertebrate Section for many years, his reports (North Riding) were always a model in accuracy and quality. Maintaining his interest to the end, his last report, written in September, surveyed events in 1945 around Scarborough, and was of his customary standard. He often lectured to the Vertebrate Section, on many sides of Zoology, always clearly and capably, using his own slides to illustrate. He was one of the few still living who had contributed to Nelson's *Birds of Yorkshire*, and was a frequent contributor to *The Naturalist* and to *British Birds* back to the first issue.

Careful ornithologist as Clarke was, his greatest loss is to the department of marine zoology. For many years all unusual species of fish brought into Scarborough harbour have been methodically recorded by him with attendant data.



He was the discoverer of the visits of the Tunny to the Yorkshire coast. In 1933, when a Giant Squid was washed ashore at Scarborough and proved to be an unknown species, it was named by the Natural History Museum authorities *Architeuthis Clarkei* in honour of Mr. Clarke who secured it for the National Collection. Mr. Clarke was a keen and ardent fisherman and spent many days sea fishing. He was also a member of the Forge Valley Angling Club, and was most helpful in stocking the Derwent with fish. He was also a member of the Footpaths Preservation Society.

Scarborough and Yorkshire can ill-afford his loss, he was so thorough, careful and conscientious. He was most particular in his observations and facts, and never made a record without the most careful inquiry. He was made President of the Scarborough Field Naturalists' Society during its jubilee year, and the members presented him with an illuminated address recording his long, valuable, and indefatigable work in the interest of the Society he helped to found and which was so close to his heart. He has left a remarkable and complete collection of charms and amulets (a subject in which he was always interested) to the Scarborough Museum, together with a valuable library of books.

His disposition was one of great kindness and consideration, and I have many times seen him carefully remove a snail or insect from his path fearing some one might put his foot on it. Having known him over sixty years, I never saw him out of temper, and he either said nothing or spoke well of everyone.

Scarborough has lost a great-hearted gentleman and is poorer indeed for his loss.

E. R. C.

The *London Bird Report* for 1944, published December, 1945, by the London Natural History Society, and edited by a committee with R. S. R. Fitter as chairman, contains breeding records of five pairs of Black Redstarts in the area; and of a pair of Little Ringed Plovers that reared three young in a gravel-pit near Ashford.

The classified notes are numbered correspondingly to Witherby's Check List in lieu of printing full scientific names—a practice the Yorkshire Naturalists' Union has adopted for some years past. The estuary and valley of the Thames (within 20 miles of St. Paul's Cathedral) maintain their ornithological interest remarkably well considering the enormous acreage of built-up area. Thirteen species of duck occurred on the various waters. The recoveries of Tufted Ducks ringed in St. James' Park are summarised by T. L. Bartlett; and include a bird recovered at the same place ten years later; and winter sojourners recovered in spring in Sweden and farther north. Glaucous, or Iceland, Gulls are recorded, and variations in size and field characteristics of these two species have led to an investigation into methods for their field identification which is still proceeding. G. E. Manser reviews the records at Elmer's End Sewage Farm for the years 1935-1938.—R. C.

We have recently received several typescript *Bulletins of the Jerusalem Naturalists' Club*, edited by Capt. Eric Hardy. As Education Officer attached to the Palestine Command Signals, these bulletins reflect not only the encouragement given to educational work in H.M. Forces, but Capt. Hardy's personal interest and enthusiasm for natural history. The Jerusalem Club, which has established close liaison with the Hebrew University at Jerusalem, as well as publishing these bulletins dealing with natural history notes and records from Palestine, Trans-jordan and Sinai, also organises field excursions and discussion meetings.

The Club has evidently been fortunate to have in Capt. W. Harding a botanical enthusiast with a considerable knowledge of the Palestinian flora. Botany and ornithology predominate in the bulletins, and in addition to the enumeration of birds observed in the Jordan Valley, at Lake Tiberias, on the coast and various other localities, and a Check List of the Birds of Palestine which comprises Bulletin No. 8, there are some interesting observations on bird migration. Swallows are noted as arriving in the Jerusalem area at the end of September, Chaffinches in mid-October, and Redstarts and White Wagtails ten days later, while early in November a large influx of Continental Robins is recorded. In July a flock of migrating Storks was observed and birds ringed in Heligoland and Riga were recovered in the district before the war.

## THE YORKSHIRE NATURALISTS' UNION EIGHTY-FOURTH ANNUAL REPORT

(Presented at Halifax on Saturday, December 1st, 1945)

**The Eighty-third Annual Meeting** was held in the Art School and Technical Institute, Skipton, by the kind invitation of the Craven Naturalists' Society on December 2nd, 1944. The Annual Report for 1944 was presented there and is printed in the January-March, 1945, issue of *The Naturalist*.

**The Presidential Address** on 'Martin Lister and Yorkshire Geology and Conchology' was given by J. Wilfrid Jackson, D.Sc., F.G.S., F.S.A., of Manchester. This was printed in *The Naturalist*, January-March, 1945.

**The Presidency** for 1946 has been offered to and accepted by Mr. A. A. Pearson, F.L.S., of Hindhead, Surrey.

**The Excursions** for 1946 will be:

June 8-10—Spurn, V.C. 61.

„ 22—Ainderby Bottoms (Northallerton), V.C. 65.

July 6—Ilkley, V.C. 64.

„ 20—Robin Hood's Bay, V.C. 62.

Aug. 3-5—Thorne, V.C. 63.

**The Union's Activities in 1945.**—Now the war-time period has ended we can look forward to a time when normal transport services will be resumed and catering freed from the restrictions that have made it so difficult to arrange for meals. The lifting of the blackout regulations already made it easier to arrange for indoor meetings and the prospect for the future is a promise of better times.

In spite of the many difficulties attendance at the excursions was very satisfactory, in fact the demand for accommodation at Whitsuntide proved too great and some disappointment resulted. It is very difficult to add forty people to the visitors' list in small country villages at holiday times. We were fortunate in having good weather on our excursion dates this year and the results were gratifying to those who helped your Secretary so well in making the arrangements and the thanks of the Union are due to these workers.

It should be possible to arrange for more meetings of Sections during the coming year; a gathering of a handful of experts on some special branch of natural history may kindle enthusiasm latent in a casual attender and one duty of the Yorkshire Naturalists' Union is to make naturalists.

### New Members:

Miss F. H. Bradley, 1 Pilgrims Lane, Hampstead, N.W.3.

Mr. M. D. Barham, 17 St. Martins Grove, Chapel Allerton, Leeds 7.

Mr. H. Baker, B.Sc., Thurstlestone, Thrybergh, Rotherham.

Mr. J. A. Baldwin, 60 Rossett Green Dene, Harrogate.

Miss Joan E. Bartle, B.Sc., 3 Clifton Crescent, Wheatley Hills, Doncaster.

Miss Margaret M. Bartle, B.Sc., St. Helen's House, Newbold Road, Chesterfield.

Prof. C. G. C. Chesters, University College, Nottingham.

Mr. J. Edelsten, 16 Belmont Road, Harrogate.

Mr. H. Foster, 40 Union Street South, Halifax.

Mr. K. L. Fox, 369 Heneage Road, Grimsby.

Mr. Alan Hadfield, M.A., 16 Park Parade, Harrogate.

Mr. R. Howarth, Mylgwin, Sulby Glen, Isle of Man.

Mr. J. S. Holloway, 54 Oakwell Oval, Leeds 8.

Mr. D. M. Jesper, 23 Woodlands Grove, Harrogate.

Rev. T. B. Kitchen, Brayton Vicarage, Selby.

Mr. J. G. Knight, 5 Ings Road, Almondbury, Huddersfield.

Rev. O. J. Lambert, O.J., Ampleforth College, Yorks.

Capt. G. W. Lawrence, Recp. Camp, Tilgate, Crawley, Sussex.

Mr. R. P. Libbey, B.Sc., Prospect Cottage, Eldwick, Bingley.

Librarian, University College, Hull.

Mr. J. H. Leach, 4 Albion Street, Leeds 1.

Dr. T. Lovett, M.B., Ch.B., Harden, Austwick via Lancaster.

Mr. E. W. Mason, M.A., 63 Kings Road, Richmond, Surrey.

Miss C. M. McQuillin, 7 Salisbury Street, Skipton.

Miss A. E. Montagu, Low Borran, Windermere.

Rev. E. J. Pearce, M.A., F.R.E.S., House of Resurrection, Mirfield.

Miss M. C. Pearson, St. John's Vicarage, Wetherby Road, Leeds 8.  
 Mr. M. Pemberton, Sun Hotel, Haworth, Keighley.  
 Mr. J. A. Rodgers, Walton Head Farm, Pannal, Harrogate.  
 Mr. W. J. Sanders, 34 Gipton Wood Avenue, Leeds 8.  
 Mr. H. J. Scott, Fellside, Clapham via Lancaster.  
 Mr. S. Sunderland, Cragg Mount, Midgehole Road, Hebden Bridge.  
 Mr. H. L. Stembridge, Middlebarrows, Huby, Leeds.  
 Mr. T. F. Spence, Red Hills Grange, Ripon.  
 Mr. E. A. Smith, 26 New Walk, Beverley.  
 Mr. F. A. Sowter, F.L.S., 9 North Avenue, Leicester.  
 Miss Elia Swires, B.Sc., 124 Armthorpe Road, Doncaster.  
 Miss J. Sykes, Wayside, Copmanthorpe, York.  
 Mr. E. Thompson, 1 Melton Street, Batley.  
 Director, Tolson Museum, Huddersfield.  
 Mr. D. H. Valentine, M.A., Ph.D., University Science Laboratories, South Road, Durham.  
 Mr. H. Walsh, 1 Dyehouses, Luddendenfoot.  
 Mr. D. F. Walker, 65 Glen View Road, New Close, Shipley.  
 Mr. Arnold B. Walker, Bella Vista, Uppang Lane, Whitby.  
 W. Arthur Wilson, Ridgemont, Hartley Avenue, Leeds 6.  
 Mr. Alan H. Woodward, 87 Wensley Road, Leeds 7.  
 Yorkshire Archeological Society, 10 Park Place, Leeds 1.

### Family Members :

Mrs. Braham, 66 Sheepridge Road, Huddersfield.  
 Mrs. F. L. Carr, 275 Ringinglow Road, Sheffield, 11.  
 Mrs. Flint, 23 Park Mount, Leeds 12.  
 Mrs. E. Holmes, 28 Farfield Road, Shipley.  
 Mrs. W. D. Hincks, 46 Gipton Wood Avenue, Leeds 8.  
 Mrs. J. H. Leach, 4 Albion Street, Leeds 1.  
 Mrs. E. W. Mason, B.Sc., 63 Kings Road, Richmond, Surrey.  
 Mr. C. G. Rob, M.A., F.R.C.S., Catton Hall, Thirsk.  
 Mrs. H. J. Scott, Clapham via Lancaster.

### Resignations :

Mr. H. Baker, of Thrybergh.	Miss H. M. Nutton, of Huddersfield.
Mr. S. B. Hodgson, of Berkhamstead.	Miss Pilling, of Huddersfield.
Miss D. J. Hopkins, of Beverley.	Mrs. D. W. Slack, of North Ferriby.

### Deaths :

Mr. J. W. Akeroyd, of Leeds.	Dr. J. H. Fryer, of Bardsey.
Mr. M. D. Barnes, of Huddersfield.	Mr. F. E. Milsom, of Kirkburton.
Mr. J. J. Brigg, of Kildwick.	Dr. H. D. Smart, of Woodford Green.
Mr. W. H. Burrell, of Horsforth.	Mr. T. Sheppard, of Hull.
Mr. A. E. Bradley, of Hampstead.	Mr. J. Teale, of Yeadon.
Mr. J. E. Clarke, of Burleigh Redroofs.	Mr. T. Waddington, of Leeds.
Mr. W. J. Clarke, of Scarborough.	

### Changes of Address :

Miss M. Andrews, B.Sc., to 42 Oakdene Avenue, Darlington.  
 Dr. R. G. Abercrombie, B.A., M.B., to Hillside Hotel, Hathersedge.  
 Miss K. Baldwin, to 43 Old Lane, Beeston, Leeds 11.  
 Mr. Ralph Chislett, to Brookside, Masham, Ripon.  
 Mr. G. R. Edwards, to c/o 33 Deveron Street, Huntley, Aberdeenshire.  
 Mr. W. F. Fearnley, to 2 Eaton Road, Ilkley.  
 Miss D. Hilary to 17 Fairfax Road, Bingley.  
 Mr. A. Malins Smith, to 6 Redburn Drive, Shipley.  
 Mr. A. G. Parsons, to Pinderfields E.M.S. Hospital, Wakefield.  
 Mrs. E. Redfearn, to 114 Westgate, Pickering.  
 Mr. E. M. Rutter, to 27 Clifton, York.  
 Mr. W. O. Steel, to Redlands, Maidenhead Court, Maidenhead, Berks.  
 L./Cpl. T. M. Telsch, to 33593443 H.Q. Comm. Zone, I.N.T.L., Div.O.C.E., U.S. Army.  
 Mr. J. P. Utley, B.Sc., to Fullicar, Brompton, Northallerton.  
 Mr. A. Wilson, to 6 Farndale Avenue, Northallerton.

### Change of Secretary :

Hull Scientific and Field Naturalists' Club, Mr. A. K. Wilson, 6 Southgate, Hessle.

Greetland and West Vale Naturalists' Society, J. L. Wilkinson, of Woodside Terrace, West Vale, Halifax.

Wharfedale Naturalists' Society, C. Thompson Walker, Crescent House, Ilkley.

### BOTANY

(Chris. A. Cheetham) : Throughout summer and autumn very varied reports have come to hand of weather conditions and of flower and fruit crops so that it seems best to leave our reporters to state their own views.

At Austwick this year the very low temperatures in January killed many shrubs in the gardens and Gorse suffered in exposed places. February brought more open weather, Snowdrops and Winter Aconites bloomed in the first week whilst towards the end of the month some sunny days gave spring flowers an opportunity for an early display. Celandines and Coltsfoot were seen on March 1st, Primroses on March 3rd. The Purple Saxifrage opened its first flowers on March 7th and both the Daphnes were in full bloom at this time. Wood Anemones and Goldilocks flowered in mid-March. The Oak came into leaf on April 19th but the Ash was much later, it was May 11th in the Settle area when its first leaves were seen although it was in leaf in Leeds at the end of April. The Hawthorn's May-blossom was seen on April 26th, a very early date for this May flower for which we often have to wait until June at Austwick. The Mealy Primroses on Sulber were past their best on May 7th and Wild Roses and Rock Roses were in bloom on May 30th.

Some wild weather in early May with very cold winds did much damage to young foliage in exposed places and the wild wet weather at the end of the month and the first week of June spoilt the outlook for the fruit crops. The latter part of June, all July and August were fine and farmers had a very good time for getting in the hay and the harvest of grain crops.

A changeable year like 1945 has reacted on the flowering of plants giving good displays in a few cases but not generally. The flowering was not good in the Settle district. Primroses were fairly good and the Mountain Everlasting and Moonwort Fern seemed to be more in evidence than they normally are, but the early annuals such as *Erophila verna* and *Saxifraga tridactylites* were much fewer than normal. Flowers of every kind were scarce in Colt Park Wood on May 11th and most of the Wild Orchids made a poor display of flowers.

The Wild Roses have had a good crop of Hips, the Hazel has not repeated the exceptional crops of 1943 and 1944 but it has produced a fairly normal quantity of nuts. Our Rowan trees are practically without berries and speaking generally fruit crops on the trees and shrubs are poor. A fair proportion of Ash trees carry a good number of keys but Oak, Sycamore, Guelder Rose, Alder, Birch and Beech are all poor ; Elder is fairly good, Blackberries a very good crop, no fruit has been seen on the Cloudberry, but Cranberry has been fairly good. The Hawthorn is very variable, some few trees have very good crops but many are bare, the early flowering in some places extended the flowering period. Possibly the bushes which bloomed early had the fruits destroyed by the May frosts whilst the flowers of the later bushes escaped. This may account for the variation in the Wild Crab Apples, some have good crops, others are without a fruit.

The question of secondary foliage has been a difficult one, the early time of starting, then the destruction of young leaves in exposed places and the variable spells of weather have brought out new foliage on more than one occasion. When young leaves escaped the frosty winds they appear to have been checked in growth and the leaves are small and have never fully clothed the trees ; the Oak has shown this very definitely in some areas. This variable weather has resulted in the second flowering of many plants, the Honeysuckle in October having many sprays of bloom amongst the fairly good supply of berries. Fungi have been scarce in the fields due no doubt to the dry summer.

The Calluna attacked by the Heather Beetle in 1944 has made no new growth and the plants are evidently dead. In some areas where an effort was made to destroy the pest by fire it was not burnt far enough beyond the attacked area and now around these burnt portions the beetles have continued their destructive activities. Fortunately weather conditions of 1945 have been less favourable



to the beetles and the *frosted* areas are much restricted. The worst noted is on Mewith Moor, south of Bentham.

SHIPLEY DISTRICT (A. Malins Smith) : No account of 1945 should omit to mention the remarkable warmth of the early months of the year. February was already so genial that special effects on vegetation were noted, of which I will only mention the development of capsules on *Pellia*, seen on February 27th, the usual date being about the middle of March. This warmth was continued through March and April and the leafing of trees was very early. Though no Ash tree in this district was in leaf before the end of April, yet by April 22nd the Oaks could be said to be in leaf generally and the Hawthorn was in flower on April 28th, both record dates for earliness. The Beeches on April 22nd were very variable, some in full leaf, some still in close bud, and others with open leaves on the lower branches only. This state of affairs was destined to last for some time, for on April 30th came the great frost which stopped further development for at least a fortnight, so that the woodland view of the last week of April became a still instead of a slow motion picture. A characteristic feature seen in Ash, Sycamore and Oak as well as Beech was the appearance of leaves on the lower branches of the trees, while the buds on the upper branches were still closed. The frost damage at the beginning of May was widespread and severe. Trees noted as showing damage were Elm, Oak, Elder, Pear, Sycamore, Hawthorn and Horse Chestnut. Young leaves of Buckler Fern and shoots of Black Bryony in the woods suffered as did the *Polygonum* of the city waste areas. In my garden Lady Fern, Columbine, Lupins and Roses were specially noted as showing limp shoots which later turned black. The frost left its mark upon the fruiting results of the whole summer. Two outstanding features early in the year were : (1) The abundance of Ash seedlings. (2) The heavy crop of fruit on the Elm.

Our annual reports show the last good crop of Ash fruits was in 1943, these were noted hanging on the trees in June, 1944, and these germinated in abundance, April, 1945

Abundant fruits.—Downy Rose and Pear.

Good Crops.—Raspberries, Blackberries, Lime, Hawthorn (but variable).

Moderate Crops.—Apples, Rowan, Elder, Woody Nightshade, Dog Rose and Honeysuckle.

Poor Crops.—Oak, Crab Apple, Sycamore and Alder.

None.—Hazel, Holly, Beech, Ash, Guelder Rose, Sloe, Plum, Horse Chestnut and Black Bryony.

Special note should perhaps be made of the Oak. I have had reported to me one or two trees with good crops, but have myself only seen odd scattered acorns on some trees, with the majority quite barren.

I turn now, as I have done in previous reports, to the question of distinguishing between two causes of poor fruiting : (1) poor flowering (2) failure of fruit development after good flowering. I note this year two instances of the former :—(1) In this district there was very little flower on the Ash and so poor fruiting was inevitable (2) Near my house is a *Sorbus* which last year had a very heavy crop of fruits. This year the earliest sign of life was the enlargement of a few buds only. These were the blossom buds and for each one of them there is now a good bunch of fruits. From the earliest move of the tree in the spring a small crop was certain, as so few buds were marked out as blossom buds. Both these instances show that present crops depend upon events, presumably weather conditions, of 1944, so that our 1945 crops are most likely in these instances a result of the poor summer of 1944. On the other hand adverse conditions of 1945, particularly the severe frost of the end of April, are a sufficient cause for the poor results in other species. As instances, the almost complete failure of Sycamore and Oak were almost certainly due to this as their flower buds were exposed to the frost. I noted that of two Apple trees in a neighbour's garden one blossomed and set fruit before the frost and bore a good crop, the other flowered later, was exposed to the frost and only bore three or four fruits. The abundant Pear crop resulted because the early flowering escaped the frost at the critical period.

Secondary growth was abundant from early July onwards on many species especially the Oak.

Flowering was early ; besides the Hawthorn I noted Hazel catkins, February 17th ; Moschatel, April 7th ; Bluebell, Garlic, Wood Pimpernel, Cuckoo flower, April 30th ; Wild Roses, June 9th.

HUDDERSFIELD DISTRICT (W. E. L. Wattam, October 1st, 1944, to September 30th, 1945) : The year will be remembered by reason of the weather vagaries of the month of April with its tropical outburst, and early May with its frost intensity. The first wintry touch came with November, 1944, intensifying gradually from the 8th to the 30th January, 1945, and including a snowfall of about ten inches. Frosts occurred on 23 nights. The rainfall for January was about four inches. February was marked by frequent gales accompanied by heavy rainfall, the fall for this month being 4.84 against a normal of 2.60 inches. Sunshine was 1.77 hours. March brought drying winds and much sunshine, the rainfall coming towards the close of the month. April opened with heavy rain and sleet showers with frosts at night on the early days of the month. On the 19th to the 22nd came the tropical outburst creating for the Huddersfield district temperature records, on the 19th, 69 degrees and on the 22nd, 70 degrees. The response of nature was shown in the development of the foliage of most trees, outstanding being the blossoming of Horse Chestnut trees at Newsome. On the 22nd April came a drastic drop in temperature with a severe ground frost of 13 degrees on the 23rd and 27th, the closing days of the month being marked by heavy showers of sleet. May throughout was a month of variable weather. Torrential rainfall was frequent and sunshine limited. The frosts of late April and early days of May caused a large amount of shrivelling on developing foliage of trees. The coniferous woodland belts at High Hoyland suffered much destruction. The Laburnum blossom was caught by the severe frost and turned to a sickly greenish yellow whilst fruit of *Ulmus montana* hung in shrivelled masses. June, July and August gave mixed weather, although early June was disappointing a gradual improvement was subsequently maintained with a fair number of sunny days, but no heat waves of long duration. August furnished 150 hours of sunshine and 3½ inches of rain. The full effects of the May frosts was shown by the new foliage on most trees which had been retarded in their growth whilst the ruin of the first fruit promises was apparent. However, despite these drawbacks it can be said that the floral display throughout the seasons has been satisfactory. An early record was blossoms of the Wild Hyacinth and Tuberous Moschatel on the 6th April in Dean Wood, Cawthorne. My fear that Petty Whin (*Genista anglica* L.) was destroyed by the agricultural cleansing of the rough pastures at Bank Top, High Hoyland, is dispelled as on August 6th this year I noted five plants in blossom in this old locality.

FRUITING IN HUDDERSFIELD AREA.—Hawthorn, Elder, Bramble, splendid crops. Pear, Apple, Wild Crab, good crops. Various species of Oak, Alder, Birch, White Beam, quite good. Mountain Ash, quite good but less than 1943-44. Lime, Walnut, Holly, moderate. Horse Chestnut, Elm, Sycamore, Ash, Wild Cherry, all flowered well but fruit all spoilt by frost. Beech, Hazel, Bilberry, Crowberry, Cloudberry, poor.

Miss C. M. Rob writes from THIRSK : The severe frosts have affected the fruit crops in this district. Apples in particular have suffered greatly, Pears and Plums rather less, but the crop is poor. The Beech which flowered so well last year, has been very poor. Ash suffered from frost, and there seems to be no fruit at all on any of the trees around here. Oak, Horse Chestnut, Sycamore, and Hawthorn were about an average flowering ; Horse Chestnut has a good crop of fruit.

Gooseberries have been well above the average in my garden, while at my brother's not a mile away the crop was damaged by frost.

Elm flowered and fruited extremely well, also Hazel.

PICKERING DISTRICT (E. G. Highfield) : The winter was very severe especially in the latter part of January. There was a heavy snow blizzard on the night of January 18th and this was followed by a period of keen frost ; temperatures ranging about zero fahrenheit were recorded on several nights. Later on in the year when the spring was advanced, it was seen that the frost had done a lot of damage especially in gardens. Many shrubs including Roses, Syringa, Laurel, Veronica, Cypress and Lonicera were killed. Privet hedges turned black and lost their leaves, but later put out new growth. In some places the Gorse turned brown and withered, but the effect was not so general as it had been in 1940.

March was a fine and dry month, all the early flowers were soon in bloom ; *Gagea lutea*, *Omphalodes verna* and Green Hellebore flowered very abundantly.

The fine weather continued into April and conditions became very droughty. Sycamore, Chestnut and Hawthorn were in full leaf and flower. Early Purple Orchid and Greenwing Orchid were very plentiful. At the end of April there was

a very severe cold spell lasting for about ten days, with strong northerly gales. This caught the Apple trees in full bloom and in consequence there are very few Apples in this district. Pear and Plum which had flowered earlier and got the fruit set were not so much affected. We had some hot spells in June and July, but on the whole the summer has been chilly and damp. Field crops were very good but a wet August ruined much of the harvest.

At the end of July I paid a visit to Dalby Marsh and found the *Epipactis palustris* in great profusion, in addition to a large number of flowering plants a plentiful crop of young seedlings was to be seen. The Fragrant Orchid and Marsh Orchid also were in good condition. The Long-leaved *Drosera* which grows in this marsh was not doing well; it seemed to be getting crowded out with a growth of moss.

*Trees and Shrubs*.—I have not seen any fruit on Oak or Beech and there is very little on Ash and Sycamore. Probably these spring flowering trees had their fruit spoilt by the spring blight. The summer flowering trees, Mountain Ash, Service tree and Lime have been very full of fruit. Foliage has been very dense and there is some appearance of secondary growth, especially in Oak. Hawthorn fruits, Rose hips, Elder berries and Blackberries have been abundant. Weeds both of the garden and countryside have thrived with the wet summer and lack of husbandry, Ragwort, Thistles and Great Bindweed being much in evidence in this district.

SCARBOROUGH DISTRICT (E. R. Cross) : After a severe winter and spring with very low temperatures flowers bloomed earlier than I ever remember. Mr. Harold Rowntree, who has kept a most careful record for many years, found them at least a fortnight in advance of any year he had noticed.

The May Lily (*Maianthemum bifolium*) bloomed better this year than for many years past and was in full bloom by the third week in May. For over fifty years I have never before found it in full bloom before June. The cutting down of the Larch trees has greatly benefited it. Dwarf Cornel did not bloom at all at Crosscliff, and although the plant was abundant at the Hole of Horcum, for the second year running it bloomed very sparingly there.

The cliffs were opened again this year after nearly six years of barbed wire and mines. Masses of Sweet Scented, Pyramidal, Marsh, and Frog Orchid were seen there and *Epipactis palustris* bloomed in abundance.

The late frosts severely damaged the Apple and Plum crop and both were a failure in this district. Bilberries, Raspberries and Blackberries were a very heavy crop. Rowan, Elder, Hawthorn and Beam were laden with berries and all our woods were a glorious sight with them. Horse Chestnut, Ash, Oak, and Beech were all full of fruits.

Secondary growths were numerous due to a dull sunless summer, and a wet autumn.

The following plants seem to have disappeared from the district during the last few years: *Blackstonia perfoliata*, *Hottonia palustris*, *Lathyrus sylvestris*, *Pilularia globulifera*, and *Lycopodium clavatum*.

Dodder, which was abundant at Thornton Dale last year, could not be found this.

**Records Committee** (W. A. Sledge) : The past year has produced a series of new and interesting records which compare well with those of the previous war years and this despite the departure overseas of E. C. Wallace who had contributed so richly to the records of the previous two seasons. Miss Rob, however, has now been released from war duties and hopes to have more time to devote to field work next year. Dr. J. M. Taylor has made many additions to the already lengthy list of noteworthy species found in the Thorne area. With Dr. S. P. Rowlands special attention has been paid to sedges and the systematic exploration of the green lanes and ditches in the parishes of Fishlake and Sykehouse has led to the discovery of several interesting species. Of these *Carex elongata*, long lost to south-west Yorkshire and reinstated by this discovery in the vice-county from which it was first recorded as a British plant, and the true *C. vulpina*, new to the north of England, are outstanding. No plant record from these parishes exists throughout Lees' *Flora* or the *Supplement to the Yorkshire Floras* and the district appears previously to have been entirely neglected by botanists. Three years ago Dr. Taylor recorded *Carex axillaris* from Fishlake and Sykehouse and since then has found this hybrid to be so frequent in the ditches that new localities have ceased to be listed. Some hybrid plants growing near to one of the *Carex vulpina* stations suggested that this species rather than *C. Otrubae* was one of the parent species in



the colony concerned and Mr. Nemes to whom specimens were sent, found some evidence in support of the suggested parentage though final decision on so critical a determination will require much further work. Of the other plants found by Dr. Taylor, *Hypericum dubium*, which has a sparse and erratic distribution in West Yorkshire, and *Ranunculus sardous*, which is so rarely met with in the county, are of special interest. Mr. Brown's discovery, *Carex ericetorum*, at Lindrick Common, already noted in the pages of *The Naturalist*, also calls for special mention. It is remarkable that this species, long regarded as a continental type restricted to East Anglia, should have been found in four northern vice-counties within the last three years.

Mr. S. M. Walters records another locality for  $\times$  *Vaccinium intermedium* in south-west Yorkshire. Several square yards of the hybrid plant were found growing amongst an intimate mixture of the parents and the plants were in flower on September 19th. These plants showed the same differentiation into small and large-leaved types as do those at Cardale Wood, Harrogate. On the previous day the well-known Ringinglow locality near Sheffield had been visited and here both the parents and the hybrid were in flower. Has any other botanist noted a second autumn flowering in Bilberry and Cowberry this year? There is some doubt as to whether the Sheffield station for this rare hybrid is in Derbyshire or Yorkshire. The 1 in. Ordnance Survey map shows the station as well within Derbyshire, whilst the most recent edition of the  $\frac{1}{2}$  in. Bartholomew shows it as equally definitely on the Yorkshire side of the border. Doubtless it occurs elsewhere in this region as large areas of the moors here are dominated by Bilberry and Cowberry.

Against these interesting additions must be set the loss of *Tillaea aquatica* which has now vanished from Adel Dam. The bare mud on which it flourished for many years after its discovery in 1921 has gradually been invaded by rushes and sedges until now the habitat has so changed that neither the plant nor any suitable ground on which it might be expected to linger can any longer be found.

Recorders' initials in the list are as follows :

J.E.B. = Rev. J. E. Beckerlegge.	W.A.S. = Dr. W. A. Sledge.
C.M.R. = Miss C. M. Rob.	A.M.S. = Mr. A. Malins Smith.
S.P.R. = Dr. S. P. Rowlands.	J.M.T. = Dr. J. M. Taylor.

\* = New vice-county record.

*Ranunculus Lenormandi* Schultz. (63) Ponden Clough nr. Keighley ; J.E.B.  
*R. circinatus* Sibth. (63) Kirk Bramwith ; J.M.T.

*R. trichophyllus* Chaix. (63) Kirkhouse Green, near Thorne ; J.M.T.

*R. sardous* Crantz. (63) Lane between Sykehouse and East Cowick ; J.M.T.

*Corydalis bulbosa* (L.) DC. (*C. solida*). (62) Haugh Woods, Pickering, 'well established and far removed from any gardens,' ; E. G. Highfield.

*Fumaria parviflora* Lam. (62) Thornton-le-dale ; H. Rowntree per C.M.R.

*Erysimum cheiranthoides* L. (63) Field bordering Thorne Moors ; J.M.T.

*Conringia orientalis* (L.) Dum. (62) Thornton-le-dale ; H. Rowntree per C.M.R.

*Lepidium Smithii* Hook. (63) Hatfield ; J.M.T.

*Melandrium album*  $\times$  *dioicum*. (64) Rocks by the river, Knaresborough ; H. G. Baker.

*Hypericum dubium* Leers. (63) Bushy margin of Thorne Moors ; J.M.T.

*Trifolium pratense* L. var. *parviflorum* Bab. (Det. Kew). (63) Fishlake ; J.M.T.

*Rosa Sherardi* Davies. (63) Not infrequent in the Bradford area : seen at Cottingley, Harden, Heaton, at Shibdendale near Halifax and also (64), Eldwick, Hawskworth, and between Lawkland and Giggleswick (Det. J. R. Matthews) ; A.M.S.

*Saxifraga granulata* L. (63) Over millstone grit in a field by lane from Glusburn to Cowling Hill, Carr Head, near Keighley, *S. tridactylites* L. growing on the gritstone wall of the same lane ; J.E.B.

*Tillaea aquatica* L. (64) Has disappeared from Adel Dam ; W.A.S. (*Nat.*, 1945, p. 149).

*Sison Anomum* L. (63) Dykesmarsh near Thorne and abundant in many lanes about Sykehouse and Fishlake ; J.M.T.

*Cirsium dissectum* (L.) Hill. (61) Brighton Common ; J.M.T.

*Picris Echioides* L. (63) Abundant on borders of Thorne Moors behind the colliery ; J.M.T.

*Crepis biennis* L. (63) Thorne Levels ; J.M.T. (64) Aldborough ; C.M.R.

- Vaccinium Myrtilus* × *V. Vitis-Idaea* (× *V. intermedium* Ruthe). (63) Whitwell Moor, Stocksbridge, near Penistone at ca. 1,150 ft; S. M. Walters.
- Pyrola media* L. (62) A fine patch still on Silpho Moor, near Scarborough; E. R. Cross.
- Samolus Valerandi* L. (63) Balne Pond; W.A.S.
- Lysimachia punctata* L. (61) Cottingham, a garden outcast in a ditch; E. Smithson.
- Verbascum sinuatum* L. (63) Hatfield; J.M.T.
- \**Euphrasia borealis* Towns. (Det. H. W. Pugsley). (65) Meadows in Upper Garsdale; W.A.S.
- \**E. montana* Jord. (Det. H.W.P.). (65) Cowgill, Upper Dentdale; W.A.S.
- Mentha longifolia* (L.) Huds. (64) Jum Beck, Hawksworth. Long known here to Bradford botanists but not recorded in *Flora* or *Supplement*; A.M.S.
- Chenopodium murale* L. (62) Garden weed, Catton, near Thirsk; C.M.R.
- Salsola Kali* L. var. *tenuifolia* (L.) (62) Topcliffe Station; C.M.R.
- Euphorbia dulcis* L. (62) Near Scarborough, a well-established patch; H. Rowntree. Specimens sent to me could only be referred to this species and though they differed in some respects from the descriptions were confirmed as such by A. J. Wilmott.
- Tulipa sylvestris* L. (64) Ouse Banks below Selby, several plants; Rev. T. B. Kitchen and J. R. Dibb.
- Juncus compressus* Jacq. (61) Near Howden; J.M.T.
- J. Gerardi* Lois. (63) Border of Thorne Moors, behind colliery; J.M.T.
- Butomus umbellatus* L. Three Rises lock, Bingley, probably the same station as that given in Lees' *Flora* and still flourishing there; A.M.S.
- \**Carex binervis* Sm. (61) Brighton Common and Allerthorpe Common; J.M.T. This must surely have been seen before by botanists on the sandy commons of East Yorks., but no published record appears to exist for it in this vice-county. It is omitted by Robinson and is quoted in the *Comital Flora* as one of the only two British vice-counties for which no published record exists.
- C. distans* L. (63) Near Doncaster (*Naturalist*, 1945, p. 111); S.P.R.
- C. tumidicarpa* Anders. (Det. Nelmes). (61) Allerthorpe Common; J.M.T. (63) Sykehouse; J.M.T. (64) Adel Dam; W.A.S.
- \**C. ericetorum* Poll. (63) Lindrick Common (*Nat.*, 1945, p. 111); J. Brown.
- C. gracilis* Curt. (63) Sykehouse and Fishlake; J.M.T. and S.P.R.
- C. elongata* L. (63) Fishlake (*Nat.*, 1945, p. 111); J.M.T.
- \**C. vulpina* L. (Det. Nelmes). (63) Fishlake (*Nat.*, 1945, p. 131); J.M.T. and S.P.R.
- C. Pairaei* F. Schultz (Det. Nelmes). (62) Catton; C.M.R. (63) Hatfield; J.M.T.
- C. Pairaei* F. Schultz var. *Leersii* Schultz (Det. Nelmes). (63) Wormley Hill near Fishlake; J.M.T. and S.P.R.
- C. paniculata* L., f. *simplex* Peterm. (Det. Nelmes). (63) Maud's Bridge near Thorne; J.M.T.
- C. paniculata* × *remota* (× *C. Boenninghausenia* Weihe) (Det. Nelmes). (63) Tong Park; J. A. Horne.
- Panicum Crus-Galli* L. (62) Topcliffe Station; C.M.R.
- Setaria viridis* (L.) Beauv., var. *majus* (Gaud.) Koch. (62) Topcliffe Station; C.M.R.
- Calamagrostis epigeios* (L.) Roth. (63) Kirk Sandall; J.M.T.
- Apera Spica-venti* (L.) Beauv. (63) Stainforth; J.M.T.
- Catabrosa aquatica* (L.) Beauv. (64) Bog at Gordale Head; Mrs. Appleyard per A.M.S.
- Puccinellia distans* (L.) Parl. (63) Kirton Lane, Stainforth; J.M.T.

**Bryological Committee** (F. E. Milsom) : A fair amount of active bryological field-work has been carried on during the past year, and this indirectly reflects the improving outlook, especially as regards transport. More workers are, however, needed in order that Yorkshire may take its share of the increasing interest in bryology throughout the country.

Two specially interesting finds have been made. The first is the moss, *Amblystegium compactum* Aust., new to Yorkshire, in the Fountains Abbey district. The other is that of the hepatic, *Moerckia Flotowiana* (Nees) Schiffn., new to

V.C. 63, in the Halifax area. This latter plant normally inhabits sand dunes but is occasionally found inland, as in the present case.

In connection with the confirmation of *Jubula Hutchinsiae* (Hook.) Dum. reported last year, an interesting point has arisen. Growing with the *Jubula* was an *Aneura* identified as *A. sinuata* (Dicks.) Dum. The plant recorded in the original gathering of *Jubula* in 1896 was *A. multifida*. Part of the original gathering has been traced, and the *Aneura* growing with it was also undoubtedly *A. sinuata*. It appears, therefore, as if a wrong identification was originally made.

Members of the Bryological Committee have attended the Union field meetings and the bryophytes typical of the areas have been noted, though nothing of outstanding interest has been reported.

**Mycological Committee** (Miss J. Grainger) : The past year has been one of progress and encouragement. In April a Micro-Foray was held with headquarters at the Botany Department of Leeds University, under the leadership of Mr. E. W. Mason, who brought with him several friends from the British Mycological Society to assist in launching this new venture. During the collecting at Askham Bog, Mr. E. A. Ellis, of Norwich, found a species of *Ciboria*, with tetrasporous asci, on the male catkins of *Myrica Gale*, believed to be new to science. Mr. Ellis has figured and described the species and publication will take place in due course. Fourteen new county records were added to our list and 17 species were recorded as new to V.C. 64.

At the autumn Foray at Thornton-le-Dale the gathering of agarics was somewhat disappointing, though the students of Uredines and Pyrenomycetes expressed themselves as well satisfied with the locality. The number of people attending the Foray (23) was the largest for many years. The local leaders, Mr. Garnett, Mr. Highfield and Mr. Patterson, were responsible for some well-planned outings. The visit to the Forestry Estate was much appreciated, and those of us who saw the Estate in the early days (1922) were much impressed by the extent and development of the undertaking.

The Chairman's address was on 'Notes on the Boleti,' and Dr. Grainger gave a resumé of the study of climatological factors as affecting the incidence of common plant diseases.

#### RECORD NOT IN FORAY LISTS

*Thecopsores vacciniorum* (DC.) Lagerh. New to V.C. 63.

**Ecological Committee** (Miss D. Hilary) : The work done by the members of the Bradford Naturalists on the ecology of a heather moor at St. Ives, Bingley, has been going steadily forward. Mr. Malins Smith sends the following general report :

Several visits have been paid and it has been very interesting to watch the occupation of the burnt ground by a new covering of vegetation. Details have been carefully noted as to which plants regenerate from seed and which from old stools which have survived the fire, as well as of the appearance of mosses and lichens. In addition to this, special attention has been given to the detailed recording of two soil profiles. Mechanical analyses of soils at different levels have also been carried out. It is hoped to give a fuller account of these observations in a separate report.

From Mr. Hincks comes the following report : Observations were continued on insect attacks on *Calluna vulgaris*, especially the Heather Beetle (*Lochmaea suturalis*) at St. Ives, Bingley, and elsewhere. At St. Ives, on March 24th, on the area reported last year as being badly affected and showing considerable evidences of beetle damage, the adult heather beetles swarmed in vast numbers. Almost the whole of the *Calluna* was blackened and killed and beetles were running and flying everywhere in such numbers as to render it impossible to walk a step without treading on several. The *Calluna* in the area from which they had hatched being destroyed, the beetles were actively dispersing to unaffected areas. Later in the season severe beetle damage was noted in spots some hundreds of yards distant from the dispersal areas.

At the end of July a severe infestation was examined on the moors above Hebden Bridge where almost every clump of *Calluna* supported many larvae and showed the characteristic 'frosting.' The moorkeeper here was engaged in burning the heather in an attempt to control the pest.

In connection with the recent work of Cameron and co-authors on the Heather Beetle it is difficult to credit their statement that Sphagnum is necessary for the



oviposition of the insect as there is no bog moss anywhere near the areas at St. Ives where the beetle is so numerous.

Mr. Cheetham reports similar damage done by the Heather Beetle both at Austwick and Helwith Mosses, and also at Mewith Moor in the Clapham township.

The plots on Moughton Fell, owing to their inaccessibility and transport difficulties, have not been visited this year but Mr. Wattam has contributed his observations on the growth of Juniper seedlings and sends the following report :

*Sectional paragraph in previous reports (12 whole fruits planted October 25th, 1933).*—The remaining seedling grown in soil obtained from Moughton Fell is still living but is apparently having a struggle for existence. The living portion mentioned in my October, 1942, Report has not increased in height, and the three shoots have this year produced five, four and four leaves respectively. This seedling plant is grown under natural conditions.

*Sectional paragraph in previous reports (naked seeds).*—The growth of the plants in my own garden is still vigorous and excellent. Measurements taken on the 6th October, 1945, revealed that one of the plants was  $26\frac{1}{2}$  inches in height, an increase of  $6\frac{1}{2}$  inches in three years, and the other  $23\frac{3}{4}$  inches in height, an increase of  $3\frac{1}{4}$  inches in three years.

## ZOOLOGY

### MAMMALS, REPTILES, AMPHIBIANS AND FISHES

**Mammalia** (Mrs. A. Hazelwood) : **CHIROPTERA**.—Mr. Gordon has reported that a Lesser Horseshoe Bat was caught in the early evening near Helmsley and that a Noctule was seen in the same district, the local colony of Noctules having been disturbed by military operations. The latter species has also been reported from York. The Daubenton Bat haunts the Rye in small numbers. Several Barbastelles of both sexes have been caught north-west of Helmsley, identifications by Mr. Gordon.

**INSECTIVORA**.—Hedgehogs seem to have been plentiful and widely distributed, although rather scarce in Helmsley district. Ten mature specimens were found dead on the road between Glusburn and Keighley, mostly in July. It is mentioned that the Moles are very given to forming mazes of superficial tunnels just below the turf on Tilmire in the autumn months and that the low-lying areas are literally covered with them. The Lesser Shrew is scarce in the Helmsley district, whereas the Common Shrew has been very plentiful in the same area.

**CARNIVORA**.—Many Foxes have been shot around Keighley, where they have been raiding poultry huts. They are reported numerous all over the Scarborough district, where they have frequently penetrated into the centre of the town and destroyed poultry in back-yards. One Fox raided a yard in Tollergate (Scarborough) on May 15th and killed 11 head of poultry. Over 30 Foxes have been shot around Hebden Bridge where they are well established. Badgers are well distributed in the Helmsley area, where several have been killed by passing cars ; a taxi driver travelling on the moorland road from Cringles to Bradley ran over a Badger which weighed some 25 lb., its length from snout to tail being 40 in. Otters have been seen in the River Aire near Keighley Golf Course, also in Holme Beck, Sutton-in-Craven, going upstream in the direction of Cowling. In *The Yorkshire Dalesman* for September, p. 113, appears a field note by J. Rhodes who states that he saw a Pine Marten in May last near a pool known as Red Rock, mid-way between Ingleton and Burton-in-Lonsdale, hard by Park Foot Wood, the identification of which seems entirely satisfactory. Stoats appear to have been fairly common generally ; two were seen in full gallop, one chasing the other, in a grass field near the River Aire at Keighley on May 22nd. They disappeared down a hole. A Polecat which had been caught in a snare on Malham Moor has been reported in the Press. A Common Seal was seen in the Scarborough Harbour and one on the North Sands on January 28th, and several, possibly four, about the South Bay, Scarborough, during the first week in February.

**RODENTIA**.—Although Rabbits seemed to be in their usual numbers during the early breeding season, they are now reported generally to be less numerous. A black Hare (fully black) was shot at North Deighton in October, this apparently being only the fifth black Hare shot since 1928. An adult Red-backed Vole was found, freshly killed, in Kirk Gill Wood, Hubberholme, at an altitude of 1,200 ft. O.D., on May 22nd. Bank Voles are reported to be more plentiful in the Helmsley



area, and Water Voles as less plentiful along the Rivers Ouse and Rye. Around Hebden Bridge Water Voles are on the increase on both canals and mill ponds. One old buck was collecting hemlock leaves from a few yards up the bank ; the load seemed almost too heavy for him so he dragged them down in beaver fashion, ate a good portion of them, and swam away with the remainder. *Re Rats*, the North Riding of Yorkshire Agricultural Executive Committee's skilled staff had 59,420 acres under contract during 1944. They used poison and picked up 69,177 dead Rats. They estimated that at least eight Rats were killed for every one recovered and that at least half a million Rats were destroyed. The number of Rats killed by the Corporation rat-catchers at Scarborough during 1943 was 2,289 ; in 1944, 4,566 were caught ; in January, 1945, 652 Rats were destroyed at Scarborough, 229 in February, and 1,320 during June. At Filey 1,100 Rats were killed in the last six months of 1944. No separate records were kept of Black or Brown Rats. Several Red Squirrels have been seen in Harwood Dale during September, 1945 ; one was seen racing for cover amongst rocks and trees in Hubberholme Gill (Kirk Gill on map), Buckden district, on May 22nd, and one was seen near Gravegate House, Garbrage, on March 11th. The Red Squirrel appears to be well established in the Meltham Valley near Huddersfield ; in early June parents and three young delighted audiences with their antics near to the entrance to Harden Clough, Meltham. Two pairs of Red Squirrels were introduced from Aldershot into the Hardcastle Woods, Hebden Bridge, and one pair into Broadbottom Wood in 1942. These and their offspring have increased and are spreading out into different surrounding woods where they appear to be in excellent condition. Grey Squirrels have been reported very abundant in the Hackness area, and as common all over the Scarborough district where they often penetrate right into the town. Examples have been recently seen in Westborough, Stepney Road, Nelson Street, and Avenue Road. One specimen was seen leaving a drey in Hawkcliff Wood, Steeton (near Keighley), and they were reported to be breeding there about May 26th.

**CETACEA.**—A male specimen of the Common Rorqual, 65 ft. in length, was stranded half a mile north of Skinningrove on December 17th, 1944.

**MISCELLANEOUS.**—Wild Red Deer seen at Silverdale were one Royal Stag, seven Hinds, and two fawns.

**Reptilia** (Mrs. A. Hazelwood) : Common Lizard, Slow-worm, and Adder are reported from the Helmsley area. An Adder measuring 22 in. in length was killed at Stainton Dale ; in its stomach were three adult Field Voles and several large earthworms.

**Amphibia** (Mrs. A. Hazelwood) : Great Crested and Smooth Newt are reported to be abundant in all the Huddersfield localities previously recorded, and also in the pond in Dean Wood, Cawthorne. Frogs were heard croaking in a garden at Glusburn on March 8th, and on the 12th spawn was seen in the lily pool ; on March 13th there was spawn in the paddling pool in Glusburn Park and on the 16th it was observed in Sire Bank tarn, Bradley Moor, and in ditches in Kildwick Ings. Frog spawn was first noted at Newsome (Huddersfield) on February 17th. On April 3rd spawn was abundant in many ponds at High Hoyland and Cawthorne, and in a pond in Dean Wood, Cawthorne, a large number of tadpoles had already emerged. Toad spawn was first seen at High Hoyland on May 21st.

**Pisces** (Mrs. A. Hazelwood) : Conditions in the Pennine rivers and the other fishable streams in Yorkshire have been good during this year. Good catches are reported from the upper reaches of the Aire, and the Wharfe from its source to where it joins the Ouse near Cawood has yielded Trout. Many fish have been taken from the upper reaches of the Swale and Ure, and catches from the Nidd and the Rye have been more than occasional. A disturbing factor has been the loss of Trout caused by pollution matter in the feeders of the River Aire, but the mortality has not been great. West Beck, the lower portion of the Driffield trout stream, contains the usual variety of coarse fish and Trout. (Incidentally, it is one of the few streams in the East Riding stocked with Grayling.) During the later time of the war, the stream suffered materially from enemy action as bombs fell in the stream, killing considerable quantities of fish ; it was also badly poached by the troops in the district and no fish of outstanding merit has been reported. West Beck is usually stocked annually with two-year-old Trout, but this has not been done since 1939 except for three yearly grants from the Yorkshire Fishery Board.

The Swale from Catterick down to Myton holds plenty of good-sized Barbel

and Chub, but very few have been reported caught during the present season that have been of unusual size. This statement also applies to the River Wharfe from Harewood all the way to its junction with the Ouse, though one Barbel caught recently at Ouse Bridge weighed 8 lb. 6 oz.

Bream, after being absent for many years from the River Ouse, are now to be found in all parts of the river.

Perch are numerous and of good size in the River Ouse. The increase in this class of fish may be due to an influx of fish from the River Foss, which held great numbers of Perch. All the dams on the Foss were taken down except at Yearsley Lock, thus making the whole of the river by Huntington, Hazley, and Strensall very shallow with no safe places for fish. These no doubt dropped down to the short length of deep water, and, being overcrowded, many have probably passed the lock and dam at Castle Mills Bridge and so on into the Ouse. Many Roach would also go down and the average size of these fish in the Ouse has increased greatly in recent years.

A pond at Angram netted last February produced Perch and Tench, but not a single Roach, although many of these fish were left in the pond when previously netted in 1939. A pond at Bilton Hall netted the following day produced nothing except five small Tench. In 1939 when last netted the water contained a great number of Roach and Perch. This pond is shallow and perhaps the long severe frost in 1940 killed all the fish.

Three hundred Roach were turned into the Scarborough Mere on March 17th, also 100 Perch, the average length of the fish being 7-10 in.

Pike up to 20 lb. weight have been caught at the junction of the Rivers Swale and Ure at Myton and from the Ure in the Ripon area quite recently a 16-pounder was taken.

Vast restocking has been done by the Sheffield District Amalgamated Angling Societies during the past two years. A pond situated in Hillsborough Park, Sheffield, yielded upwards of fifty thousand fish during three nettings. These fish have been placed at various points in the Dove and Dearne Canal. Wath-on-Deerne has received 7,500 fish, Worsborough Dale, 10,000, Aldham and Lewdon Bridge, near Worsborough, 3,500. These fish, when placed in the waters, weighed approximately 3 oz. each. The following large fish were taken from the Dove and Dearne Canal :

Roach, 1 lb. 14 oz. in weight, length 14½ in.

Perch, 1 „ 7½ „ „ „ „ 12½ „

Chub, 1 „ 2 „ „ „ „ 12 „

Carp, 10¾ „ „ „ „ „ 10 „

Gudgeon, 1¾ „ „ „ „ „ 3½ „

A Roach weighing 3 lb. 5½ oz. was caught (and replaced) in a pond on the Frechville Estate near Sheffield.

Plaice have been very abundant off Scarborough in recent months due, no doubt, to the stoppage of trawling during the war. 2,000 stones weight was landed at Scarborough on February 12th and 3,000 stones on February 13th ; such catches still continue (October, 1945).

The fishermen report Tunny very plentiful off the coast during July, August, and September, 1945. One weighing about 500 lb. was brought into the town in early September, but no information was forthcoming about the place of capture. It was sold for food.

Record catches of Herrings were recorded at Whitby, where 800 crans were landed on September 29th, the Herrings being sold at seven per penny. On October 1st at Whitby the catch was sold at 80s. to 91s. per cran.

**POCKLINGTON CANAL.**—In the course of preparing this report the following interesting information was received relating to the Pocklington Canal.

The canal is about nine miles long, only three to four feet deep, and it extends from the main road, York-Market Weighton, near Pocklington, to the River Derwent at East Cottingham. The bed over a good distance is limestone. The canal is not operated, nor has it been for some time, and the level has been lowered 18 to 24 inches. The supply of feed water has been curtailed and is negligible. The canal itself is divided up into levels by lock gates, which are now not opened. There are no factories anywhere along the canal banks ; consequently there can be no pollution from that source. The water appears bright and clear, though the surface in some places is almost covered with vegetation.

The canal is inhabited by Roach, Bream, Carp, Pike and Perch.

During the latter part of August for the duration of about one week, in three years out of the last four, a considerable number of mature Bream weighing up to 5 lb. each were found dead. The casualties were confined to two levels of the canal; in one section some 80 yards in length about  $1\frac{1}{2}$  miles from the point where the canal emptied into the tidal Derwent (there will, naturally, be a slight drift of water towards this point) over a 100 fish were counted, not one being under  $2\frac{1}{2}$  lb. in weight. So far the smaller fish have not been affected, the only dead ones found being one Pike, one Perch and six or seven Roach, compared with 400 big Bream, 4-5 lb. in weight.

The following extract appeared in the Seventy-eighth Annual Report on the Salmon, Trout and Freshwater Fisheries in Yorkshire publication, chapter 'Rivers Pollution,' by W. Addison, p. 21: 'A considerable number of fish (coarse) were destroyed in the Pocklington Canal. No satisfactory conclusions were arrived at as to the cause.'

No post mortems have been carried out.

The Yorkshire Fisheries Board intends to investigate the matter, and it is hoped that we may be able to print further information about it at a later date.

In conclusion may we offer sincere thanks to the following gentlemen who have so kindly co-operated with us in making this report possible: Messrs. E. W. Taylor (York), F. H. Edmondson (Keighley), W. J. Clarke (Scarborough), W. E. L. Wattam (Huddersfield), M. Longbottom (Keighley Museum), O. C. Hill (Middlesbrough Museum), A. Butterworth (Cross Hills Naturalists' Society), A. Gordon (Helmsley), R. W. Ward and G. F. White (Clerk and Conservator respectively, Yorkshire Fishery Board), D. Langstaffe (York Anglers Association), H. Haller (Brough), W. Addison (Leeds), and F. Dean (Hebden Bridge).

## ORNITHOLOGY.

(Ralph Chislett): Reprints of the detailed Annual Report for 1944 were duly circulated to members of the Committee and other contributors, and to the national ornithological organisations and press. A few copies were applied for by ornithologists in other areas.

The death on October 22nd of W. J. Clarke, F.Z.S., of Scarborough, who was for so many years such an excellent recorder for the North Riding, was a great loss to the Union. He will be particularly difficult to replace in respect of marine biology.

The field meetings of the Union have been well supported during the year, and field work has been well maintained. Members who have been on service are beginning to trickle back, J. Lord and J. P. Utley being two of the first to be welcomed.

The detailed report for 1945 will include breeding records of Montagu's Harrier, Common Buzzard, and Woodlark. There has been no authenticated record of the breeding of Woodlarks in the county for many years; and the discovery of a breeding pair by E. Rutter, which he took the precaution to get well verified, is probably the most interesting event of the year. Pied-Flycatchers are reported to have been more numerous than usual in some areas.

Swillington Ing has maintained its interest as a calling place for migrants; but its liability to floods, and its accessibility to youths of the neighbourhood, make it of little value as a breeding resort.

Spurn has been visited much more often than of recent years, and the plans for the establishment there of a migration, research station are well forward. The Northern Command has been very helpful, and a site for a ringing trap has been selected by R. M. Garnett and G. H. Ainsworth, the latter of whom has been engaged on its erection. Subscriptions to cover initial expense have been received. It is hoped to have the station working soon. We have been promised the tenancy of the Warren Cottage after military vacation.

Final data for the 1945 report should be sent as soon after the end of the year as possible, to enable proofs to be printed well before the date of the Sectional Meeting on March 9th, 1946. The Hon. Secretary apologises for delays in correspondence caused by his removal from Rotherham to Brookside, Masham, near Ripon.



## CONCHOLOGY

(Mrs. E. M. Morehouse) : Among the records received, Mr. J. H. Lumb says that for a number of years *Arion arbustorum* L. occurred in Park Wood, Elland, and then disappeared ; it has re-appeared some half-mile from the original habitat this year.

Mr. H. J. Armstrong reports *Arion ater* var. *alba* L. in Moseley Woods, Cookridge. Mr. A. Smith took *Limnaea pereger* var. *sinistrorsum* in the River Foss at York on June 9th. The snail was found on a floating piece of wood near the bank ; he also remarks on the putrid condition of the water and the scarcity of snails.

*Helix hortensis* Müller was very abundant on the railway crossing, Malton Road, four miles from York. ' Among them pink and red forms were very fine and not scarce.'

Mr. C. F. Sweetman saw *Helicella caperata* Montagu on the railway crossing, Malton Road, York, and remarks that *Helix aspersa* Müller, although very common in gardens, is not so common in the open round York.

With Mr. Smith, Mr. Sweetman took 14 species at Pickering on May 21st, including *Acanthinula aculeata* Müller and *Ena obscura* Müller, also some uncommon forms of *Arianta arbustorum* L. and *Vitrea nitidula* Drap., the latter mollusc was again seen at Ampleforth on June 2nd.

On July 25th A.S. and C.F.S. took *P. albus* Müller in the River Foss at Huntington. *Valvata piscinalis* Müller, *Bithynia tentaculata* L., *L. palustris* Müller, *Sphaerium corneum* L. and *Succinea putris* L. were also seen in small quantities.

Stanley Cook has again found *P. rotundata* var. *alba* Moq-Tan., one at Levitt Hagg, Doncaster, and the other at Conisborough Castle on July 22nd and August 5th respectively. *Pisidium nitidum* Jenyns. on September 9th at Trumfleet, *Zonitoides nitidus* Müller on July 22nd on Bentley Ings and on July 23rd at Conisborough Castle and the Castle moat. *Vitrea nitidula* Drap. turned up in a quarry on the Norton Road and at Conisborough Castle and the moat. In a pond at Bentley *L. palustris* Müller was found with a third tentacle, which was also retractile like the two others.

All the above are from the Doncaster area and taken in the company of Mr. E. Stainton.

Miss Jones found *Vivipara vivipara* var. *sinistrorsum*, a juvenile, at York on June 9th.

## ENTOMOLOGY

**Ephemeroptera** (John R. Dibb, F.R.E.S.) : The publication of the county records in the Union's *Transactions* for 1944 resulted in several correspondents supplying further notes and comments which made it possible to add further records and details to the original list. At the same time the opportunity was taken to rectify an incorrect reference. Attention is therefore drawn to the short paper entitled 'The Yorkshire Mayflies or Ephemeroptera, Addenda and Corrigenda' which appears in *The Naturalist* for the final quarter of this year. The same part of *The Naturalist* also contains a considerable number of additional Yorkshire records in the interesting paper by Mr. H. Whitehead entitled 'Some Additional Records of Yorkshire Ephemeroptera.' Eighteen species are dealt with from material collected by Messrs. Percival and Whitehead some twenty years ago, which represented the remaining portion of the collection from which the first list of Yorkshire records originated in 1927. Mr. Whitehead's supplementary list provides two new vice-county records, viz. :

*Ephemera vulgata* Linn. New to V.C. 62.

*Baetis vernus* Curt. New to V.C. 61.

Mr. Hincks supplies the undermentioned new, or second, vice-county records from material collected this year :

*Ephemera vulgata* Linn. Meltham Mills, early June (second record for V.C. 63) ; Pocklington Canal, 1/7/45, new to V.C. 61.

*Brachycercus harrisella* Curt. Pocklington Canal, 1/7/45, new to V.C. 61. Found dead in spiders web. The first V.C. 64 record for this species was similarly based upon dead specimens in spiders' webs.

*Cloeon simile* Eaton. Pocklington Canal, 1/7/45, new to V.C. 61.

The Union's excursion to Grassington in May resulted in five species being

referred to in the report of the meeting by Mr. Hincks (*Nat.*, 1945, 109), all of them previously recorded from Vice-County 64.

*Baetis rhodani* (Pict.), *B. pumilus* (Burm.), and *Rhithrogena semicolorata* (Curt.) were the only species taken by the writer at Ingleton (V.C. 64) on 1-4/9/45, and no species new to the vice-county were found. Nymphs of *Ecdyonurus venosus* (Fab.) and *Rhithrogena semicolorata* (Curt.) were present in large numbers, three or four on almost every stone in the River Greta and most of these examples were in a late stage of development. Although the weather was fine and bright there was a marked scarcity of imagines and the only swarms consisted of a few *Baetis pumilus*. During five days observations these conditions prevailed.

A useful list of ten additional records for six of the more widely distributed species occurring in Yorkshire, all from Leeds and district, has been contributed by Mr. Whitehead from material collected by him during 1943-45. It is pleasing to note in this connection that in addition to details of locus, actual dates of appearance, stage of development, and sex identifications have been included, data of special value to workers upon Mayflies.

Those interested will no doubt mark up the Vice-County Check List on page 18, of the *Transactions* for 1944 with the above-mentioned new vice-county records.

In spite of the generally poor year we can congratulate ourselves upon the very good results obtained through those members interested in this small order of insects in which much progress has recently and is now being made.

**Hemiptera** (J. M. Brown) : Judging from my own experience, the past season has again proved a poor one, the weather during the greater part of the summer having been entirely unsuitable for collecting. Only during the very fine spell in early autumn did certain insects become really plentiful. For example, Small Tortoiseshell and Red Admiral butterflies were about in extraordinary numbers, and were more numerous than I can remember noticing before. Among the Hemiptera few species of special interest came my way, so I have little to report apart from one species of *Notonecta* new to the county. Hence some boxes of specimens submitted by Messrs. J. R. Dibb and W. D. Hincks (to whom my thanks are due), were very welcome, as some of the contained insects were of distinct interest, several being additional vice-county records.

#### HETEROPTERA

- Piezodorus lituratus* F. Again plentiful on gorse on the cliffs, Robin Hood's Bay, during September.
- Pentatoma rufipes* L. Ingleton, 1-4/9/45 (J.R.D.). More plentiful than usual at Middlesbrough (W. Lillie).
- Acanthosoma haemorrhoidale* L. Barlow, 23/4/45 (J.R.D.).
- Elasmotethus interstinctus* L. Gateforth, 13/4/45 (J.R.D.).
- Elasmucha grisea* L. Skipwith, 7/8/45 (W.D.H.).
- Drymus sylvaticus* F. Gateforth, 25/3/45 (J.R.D.), R.H.B. (garden), 22/8/45-\*
- \**D. brunneus* Sahl. Askham Bog, 22/7/43 (W.D.H.), V.C. 64.\*
- \**Tingis amphiatra* H.S. Gateforth, 25/3/45 (J.R.D.); Boroughbridge, 27/6/42 (W.D.H.), V.C. 64\* and V.C. 65\*.
- Piesma maculata* Lep. Gateforth (J.R.D.).
- Nabis flavomarginatus* Sch. R.H.B. (garden), 17/7/45.
- Charoscirta cincta* H.S. Askham Bog, 3/43 (W.D.H.).
- Temnostethus pusillus* H.S. Ingleton, 4/9/45 (J.R.D.).
- Anthocoris sarothamni* D. & S. On Broom, R.H.B., 25/6/45.
- \**Orius majusculus* Reut. Boroughbridge, 14/7/45 (W.D.H.). V.C. 65\*.
- Stenodema laevigatum* L. Barlow, 20/3/45 (J.R.D.), R.H.B., 10/7/45.
- Phytocoris varipes* Boh. R.H.B. (garden), 27/7/45.
- Calocoris alpestris* Mey. Beedale (V.C. 62), 9/7/45 (W.D.H.).
- C. fulvomaculatus* De G. Askham Bog, 16/6/45 (W.D.H.).
- \**Poeciloscytus unifasciatus* F. Askham Bog, 1/8/42 (W.D.H.), V.C. 64\*.
- \**Strongylocoris leucocephalus* L. Horton-in-Ribblesdale, 30/6/42 (W.D.H.), V.C. 64\*.
- Dicyphus epilobii* Reut. Boroughbridge, 14/7/45 (W.D.H.).
- D. globulifer* Fall. Beedale, 9/6/45 (W.D.H.).
- \**Globiceps cruciatus* Reut. Allerthorpe Common, 28/6/42 (W.D.H.), V.C. 61\*.
- Cyrtorhinus caricis* Fall. Askham Bog, 1/8/42 (W.D.H.).
- Heterocordylus leptocerus* Kirs. Plentiful on Broom, R.H.B., 25/6/45.



- Harpocera thoracica* Fall. Gateforth (J.R.D.).  
*Asciodema obsoletum* Fieb. Selby, 6/8/45 (W.D.H.).  
 †*Notonecta maculata* F. R.H.B., 25/9/45, taken along with *N. glauca* L. and  
*N. obliqua* Gall. New to the county. V.C. 62\*.  
*Corixa striata* L. R.H.B., 5/10/45.  
*C. linnei* Fieb. R.H.B., 19/3/45, 26/3/45.  
*C. praeusta* Fieb. R.H.B., 6/4/45.  
*C. wollastoni* D. & S. Still plentiful in moorland pools, R.H.B., 5/10/45, 8/10/45.  
*C. concinna* Fieb. R.H.B., 13/11/44.

## HOMOPTERA

- Cercopis sanguinea* Geof. Gateforth (J.R.D.).  
*Philaenus leucophthalmus* L. forma *lineatus* Fab. Ingleton, 1-4/9/45 (J.R.D.),  
 R.H.B., 10/7/45. forma *marginellus* Fab. R.H.B., 10/7/45. \*forma  
*ustulatus* Fall. Cowthorpe, 3/8/42 (W.D.H.), V.C. 64\*.  
*P. lineatus* L. Ingleton, 1-4/9/45 (J.R.D.).  
 \**Idiocerus albicans* Kbm. Askham Bog, 20/7/43 (W.D.H.), V.C. 64\*.  
*Euscelis lineolatus* Br. R.H.B., 17/7/45.  
*Cixius brachycranus* Scott, Ingleton, 1-4/9/45 (J.R.D.).  
*Stenocranus minutus* Fieb. Plentiful in rough grass, R.H.B., 1/10/45. Only  
 recorded so far for V.C. 62.  
*Aphalara nebulosa* Zett. Grassington, 19/5/45 (W.D.H.).  
*Psylla spartii* Guer. Plentiful on Broom, R.H.B., 25/6/45.  
*Arytaena genistae* Latr. Barlow, 20/2/45 (J.R.D.), plentiful on Broom, R.H.B.,  
 25/6/45.

## COCCIDAE

- Newsteadia floccosa* De G. Holmehouse Wood, Keighley, 20/3/43 (J. Wood).  
**Neuroptera** (J. M. Brown) : The most interesting feature of the season has been the abundance of *Chrysopa carnea* Steph. in the Robin Hood's Bay district. The late G. T. Porritt regarded it as one of our rarest Lacewings, but I have records for all the vice-counties except 65. This season it has been very numerous both as hibernating individuals and in the open, and in one instance a 'terrifying' swarm was reported to me as occurring in the living room of a house not far away. The following species have occurred in the garden :  
*Hemerobius marginatus* Steph. 8/6/45.  
*Chrysopa flava* Scop. 17/6/45 and 21/6/45.  
*C. albolineata* Kill. 26/7/45.  
*C. carnea* Steph. 26/8/45, 28/8/45, and 3/10/45, besides hibernating specimens in the house.  
 and the Scorpion-fly, *Panorpa germanica* L.  
*Agulla (Raphidia) xanthostigma* (Schum.). Gateforth, near Selby (V.C. 64\*), sweeping in pine wood, 15-17/5/45, J. R. Dibb.  
**Plecoptera** (J. M. Brown) : There is nothing of special interest to report, the usual species have been taken locally, and *Leuctra geniculata* Steph. and *L. fusciventris* Steph. occurred at Ingleton, 1-4/9/45 (J. R. Dibb). *Nemurella inconspicua* (Pictet) was taken on the Hebden Bridge excursion (W. D. Hincks).  
**Orthoptera** (J. M. Brown) : Like most other insect orders, Grasshoppers have been affected by the peculiar weather this season. The two commonest species about here, *Omocestus viridulus* L. and *Chorthippus bicolor* Charp., usually occur in enormous numbers, but this year they have been very scarce indeed. The Dermapteron, *Labia minor* (Linn.), was taken at Gateforth Hall, near Selby (V.C. 64\*), flying indoors on April 21st by Mr. J. R. Dibb.  
**Hymenoptera** (W. D. Hincks) : The season which is now drawing to a close has been one of the most disappointing from the point of view of Hymenoptera that the recorder can remember. Conditions in the early spring were satisfactory enough and there seemed promise of an exceptionally good season. After a summer-like unseasonable period, however, a sudden change took place with exceptionally low temperatures which had a marked effect on nearly every tree and bush. It was this sudden change that proved so disastrous for insects which never seemed to recover throughout the season except for a short spell in autumn. Spring insects such as bumblebees, solitary bees, etc., were scarce after this period of low temperature, and the subsequent months have been very poor indeed for Aculeates. I found spring sawflies very scarce, though Mr. Wood tells me that they

were fairly plentiful in the Keighley district. With the autumn broods and later species Mr. Wood's experience agrees with mine—the insects failed to materialise at all. The cold spell was too early, however, to prevent the caterpillars of *Pteronidea ribesii* from carrying out their usual destruction to my gooseberries, assisted this year by the Magpie moth. On the other hand there have been very few *Priophorus viminalis* larvæ on the poplars and the roses have been free from sawflies.

Mr. J. M. Brown has sent the following notes on the sawflies of the Robin Hood's Bay district. 'Sawflies have been distinctly scarce during 1945 in this district, even the usually conspicuous Tenthredos have not been obvious and few Doleri seem to have been about. *Ametastegia glabrata* (Fall.) (10/5 and 21/8) and *Aglaostigma aucuparia* (Klug) (6/5) were taken in the garden. *Spiraea Ulmaria* bordering a field yielded *Empria alector* Benson (23/5), *E. baltica* Conde (28/5), *Blennocampa geniculata* (Hartig) (23/5), and *Aglaostigma fulvipes* (Scop.) (24/5). Bracken species were scarce, *Strongylogaster lineata* (Chr.) occurred 10/6. Garden roses yielded *Cladius pectinicornis* (Geoffr.) (24/5 and 5/8) and *Emphytus cinctus* (L.) (7/8). The three related species *Tenthredo arcuata* Forst., *perkinsi* (Morice), and *sulphuripes* (Kriechb.) were all seen for the first time on the same day, May 16th. Hedge gooseberries were defoliated badly by the larvae of *Pteronidea ribesii* (Scop.) by mid-May, but my garden plants were not attacked till a couple of months later. Species I have taken this season new to this district are *Blennocampa geniculata*, *Athalia bicolor* Lep. (9/6) in buttercup flowers, *Metallus albipes* (Cam.) (14/8) on garden raspberries, and *Tenthredo velox* F. in flight.'

Hymenoptera have been collected on all the excursions of the Union as reported in the pages of *The Naturalist*. At least on the excursions where interesting material was expected, namely, Askham Bog, Allerthorpe, and Boroughbridge, the results proved most disappointing.

I have again to thank Mr. J. Wood for continued help in collecting specimens. I am afraid that Mr. Wood does not get anything like the credit his important contribution deserves at the present stage of our work, but I hope this will improve in the future as more of his material is studied. To Mr. A. W. Steffox my sincere thanks are due for naming a number of specimens and to Messrs. J. M. Brown and J. R. Dibb for their lists of interesting captures.

In the list which follows, for considerations of space, I have restricted my records to those which are new to the county or vice-counties. Twenty-two new comital and thirty-seven new vice-comital records are included.

#### TENTHREDINOIDEA

\**Pamphilus balteatus* (Fall.). Grass Woods (64), 21/5/45, W.D.H., *Nat.*, 1945, 110.

\**Arge pagana stephensii* (Leach). Allerthorpe (61), 2/7/45, W.D.H., *Nat.*, 1945, 143.

\**Trichosoma silvaticum* Leach. Allerthorpe (61), 2/7/45, W.D.H., *Nat.*, 1945, 143.

\**Tenthredo mioceras* Enslin. Keighley, Holmehouse Wood (63), 13/7/40, J.W.

\**T. scrophulariae* L. Pocklington Canal (61), 1/7/45, W.D.H., *Nat.*, 1945, 143.

†*Dolerus puncticollis* Th. Ecclesall Wood (63), 20/4/38, J.M.B., *Nat.*, 1945, 96.

\**D. nitens* Zadd. Marsett (65), 16/4/35, J.M.B., *Nat.*, 1945, 96.

\**D. haematodes* (Schr.). Bainbridge (65), 12/5/34, J.M.B., *Nat.*, 1945, 96.

\**D. rugosulus* D.T. Hawes (65), 2/6/36, J.M.B., *Nat.*, 1945, 96.

\**D. ariceps* Th. Grassington (64), 19/5/45, W.D.H., *Nat.*, 1945, 110.

\**Eriocampa ovata* (L.). Ecclesall Wood (63), 6/6/35, J.M.B., *Nat.*, 1945, 96.

†*Macrophya punctum-album* (L.). Gateforth (64), 15/5/45, J.R.D.

\**Protemphytus tener* (Fall.). Boroughbridge (65), 14/7/45, W.D.H., *Nat.*, 1945, 144.

\**Monophadnus pallescens* (Gmel.). Hawes (65), 2/6/36, J.M.B., *Nat.*, 1945, 96.

†*Athalia bicolor* Lep. Robin Hood's Bay, 9/6/45, J.M.B.

\**A. cordata* Lep. Ecclesall Wood (63), 15/5/37, Smeaton (63), 31/7/37, J.M.B., *Nat.*, 1945, 96.

\**A. glabricollis* Th. Helmsley (62), 4/9/36, Kettleless (62), 9/9/37, Ecclesall Wood (63), 15/5/37, J.M.B., *Nat.*, 1945, 96.

\**Eutomostethus ephippium* (Pz.). Askham Bog (64), 16/6/45, W.D.H., *Nat.*, 1945, 134.

\**Strongylogaster lineata* (Chr.). Bainbridge (65), 12/5/34, J.M.B., *Nat.*, 1945, 96.

†*Metallus albipes* (Cam.). Robin Hood's Bay, 14/8/45, J.M.B.

\**Heterarthrus vagans* (Fall.). Allertorpe Common (61), 30/6/45, W.D.H., *Nat.* 1945, 143.

†*Cladius difformis* (Jurine). Allertorpe Common (61), 4/8/36, J.M.B., *Nat.*, 1945, 96; Boroughbridge (65), 14/7/45, W.D.H., *Nat.*, 1945, 144.

\**Priophorus eradiatus* (Htg.). Ecclesall Wood (63), 21/8/33, 26/8/37, J.M.B., *Nat.*, 1945, 95.

\**P. tener* (Zadd.). Ecclesall Wood (63), 3/8/32, J.M.B., *Nat.*, 1945, 96.

\**Nematus lucidus* Pz. Bainbridge (65), 12/5/34, J.M.B., *Nat.*, 1945, 96.

\**Pachynematus obductus* (Htg.). Ecclesall Wood (63), 28/8/37, J.M.B., *Nat.*, 1945, 9.

\**P. pallipes* Lep. Wyming Brook, Sheffield (63), 25/8/37, J.M.B., *Nat.*, 1945, 96.

\**P. ruficornis* (Ol.). Smeaton (63), 31/7/37, J.M.B., *Nat.*, 1945, 96.

#### BRACONIDAE

\**Bracon guttiger* Wesm. Pocklington Canal (61), 1/7/45, W.D.H., *Nat.*, 1945, 143.

†*Pygostolus falcatus* (Nees.). Beedale (62), 7/6/45, W.D.H. (A.W.S.).

\**P. sticticus* (F.). Beedale (62), 7/6/45, W.D.H., *Nat.*, 1945, 140.

\**Ichneutes reunitor* Nees. Grassington (64), 19/5/45, W.D.H. (A.W.S.).

†*Dolopsidea aculeator* (Mshl.). Allertorpe Common (61), 30/6/45, W.D.H., *Nat.*, 1945, 143.

†*Agathis nigra* Nees. Allertorpe Common (61), 30/6/45, W.D.H., *Nat.*, 1945, 143.

†*Opius victus* Hal. Beedale (62), 9/6/45, W.D.H. (A.W.S.).

†*Trachyusa aurora* (Hal.). Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 140.

†*Tanycarpa gracilicornis* (Nees.). Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 140.

\**Phaenocarpa ruficeps* (Nees.). Pocklington Canal (61), 1/7/45, W.D.H., *Nat.*, 1945, 143.

†*P. canaliculata* Stelfox. Askham Bog (64), 16/6/45, W.D.H. (A.W.S.).

\**Coelinidea nigra* (Nees.). Boroughbridge (65), 14/7/45, W.D.H., *Nat.*, 1945, 144.

†*Rhizarcha pubescens* (Curtis). Beedale (62), 9/6/45, W.D.H. (A.W.S.).

†*Ephedrus brevis* Stelfox. Grass Woods (64), 21/5/45, W.D.H., *Nat.*, 1945, 110.

†*E. picticornis* Stelfox. Bingley, St. Ives (63), 13/5/44, J.W., see *E.M.M.*, 81, 1945, 144.

\**E. plagiator* (Nees.). Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 140.

†*E. lacertosus* (Hal.). Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 140.

†*Trioxys heraclei* (Hal.). Sunnydale Morton (63), 8/8/36, J.W.

\**Aphidius rosae* Hal. Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 140.

\**A. ervi* Hal. Boroughbridge (65), 14/7/45, W.D.H., *Nat.*, 1945, 143. Bingley, St. Ives (63), 28/7/45, W.D.H.

\**A. avenae* Hal. Boroughbridge (65), 14/7/45, W.D.H., *Nat.*, 1945, 144.

#### ICHNEUMONIDAE

†*Hemiteles biannulatus* Grav. Askham Bog (64), 16/6/45, W.D.H. (A.W.S.), *Nat.*, 1945, 133.

†*Ischnoceros flicornis* Kriechb. Askham Bog, 16/6/45, W.D.H., *Nat.*, 1945, 133.

\**Promethes cognatus* (Hlg.). Grassington (64), 19/5/45, W.D.H., *Nat.*, 1945, 110.

#### TORYMIDAE

†*Megastigmus spermatrophus* Wachtl. Beedale (62), 9/6/45, W.D.H., *Nat.*, 1945, 141.

#### ENCYRTIDAE

\**Bothriothorax clavicornis* (Dalm.). Leeds, Roundhay Lime Hills (64), 29/10/44, W.D.H.

†*Blastothrix sericea* (Dalm.). Bingley, St. Ives (63), 12/8/44, 28/7/45, W.D.H.

†*Cerapterocerus mirabilis* Westw. Bingley, St. Ives (63), 28/7/45, W.D.H.

**Diptera** (Chris. A. Cheetham): The year has been very disappointing to dipterists, most of the common species have been far fewer than normally and only a few have occurred in anything like their usual quantity.

On April 19th *Dactylolabis sexmaculata* Mcq. was about in usual quantity in the crevices of the limestone and at the same time *Dicranota pavidula* Hal. was taken



on stones in a streamlet at Oughtershaw, this is *longitarsis* in Pierre. The Tipulas, *subnodicornis* Zett. and *vittata* Mg., were caught on this occasion.

On Austwick Moss, May 9th, I got *Sericomyia lappona* L., *Tipula vittata* Mg., *vernalis* Mg., *subnodicornis* Zett., *oleracea* L., and *luna* Westh. The latter, generally plentiful, has been scarce this year, the same applies to *Phalacrocer replicata* L. I found this species later in the year at 1,200 ft. O.D. on Sulber.

At Whitsuntide, in Grass Woods, a nice addition to our list was *Tipula nubeculosa* Mg.; it is very close to the normally plentiful woodland species, *T. scripta* Mg. (which has been very scarce this year). Wingate's division of the two by the dorsal stripes is unreliable, as *scripta* varies considerably. Pierre's antennae, annulated or not, is better, but still difficult occasionally, but the ♂ genitalia are distinct.

Another interesting species at Grassington was *Hexatoma bicolor* Mg. (*Peronocera lucidipennis* Curt.) on a shingle bank in the river. I have had this species in Coverdale and Teesdale (Durham). There is a record in the *Victoria County History* for the other species, *fuscipennis* Curt., from Bolton Bridge, but this is probably also *bicolor* Mg. I got *fuscipennis* Curt. in quantity on nettles by the slow stream at Nunnington with no shingle at hand.

At Boroughbridge, July 14th, diptera were few, but two interesting species were caught. A small nicely marked Stratiomyid, *Oxycera trilineata* F., and a Linnobid, *Trimicra pilipes* F., this is said to be sporadically common, but apparently is a southern species, the previous Yorkshire record was one caught by H. Maxwell Stuart at Everingham. At Boroughbridge it occurred on the small marshy areas at the riverside.

On September 5th at Lawkland Moss I got *Cordylura pudica* Mg., and here *Tipula luteipennis* Mg. was fairly plentiful. I got a single *melanoceros* Schum. but this species was plentiful on Sulber at 1,300 ft. O.D. and on Pen-y-ghent at 2,000 ft. O.D. At this time the common *marmorata* Mg. was widespread but much less plentiful than usual.

In open areas early in the year very few of the common *vernalis* Mg. were seen, but in October *pagana* Mg. seemed to be as plentiful as it is normally.

The only Syrphid in good supply was *Sericomyia borealis* Flin.

**Trichoptera** (H. Whitehead) : The season has not been a good one for Trichoptera. Twenty-two species have been recorded. Mr. Hincks took a specimen at Boroughbridge which may prove to be a new county record, but confirmation by a referee is awaited. Another of his captures at the same place was *Limnophilus rhombicus*, which is new to V.C. 65. Several pupae taken at Bramhope in June were bred out and one of these, *L. marmoratus*, is new to V.C. 64.

Mr. Hincks allowed me to examine specimens which he took at the meeting at Hebden Bridge. I am indebted also to Mr. J. M. Brown for records from Robin Hood's Bay and to Mr. J. R. Dibb for records from Ingleton.

*Phryganea varia* L. ♀, Bramhope, bred out, 10/6/45 (H.W.).

*Limnophilus rhombicus* L. ♀, Boroughbridge, 14/7/45 (W.D.H.); ♂, on a window, Chapel Allerton, Leeds, 9/7/45 (H.W.).

*L. marmoratus* Curt. ♂, Bramhope, bred out, 14/7/45 (H.W.).

*L. stigma* Curt. ♂, Bramhope, 22/6/45 (H.W.).

*L. centralis* Curt. ♀, in house, Chapel Allerton, Leeds, 28/8/45 (H.W.).

*L. vittatus* F. Robin Hood's Bay, 1/4/45, 22/3/45, 1/10/45 (J.M.B.).

*L. affinis* F. Robin Hood's Bay, 26/8/45 (J.M.B.).

*Anabolia nervosa* Curt. Robin Hood's Bay, 25/9/45, 8/10/45 (J.M.B.).

*Drusus annulatus* Steph. Ingleton, 1-4/9/45 (J.R.D.).

*Silo pallipes* F. ♂, Hebden Bridge, 11/8/45 (W.D.H.).

*Beraea maurus* Curt. ♂♀, Adel Beck, Leeds, 12/7/44 (H.W.); Robin Hood's Bay, 30/6/45 (J.M.B.).

*Odontocerus albicorne* Scop. Robin Hood's Bay, 30/6/45 (J.M.B.).

*Leptocerus cinereus* Curt. ♂, Boroughbridge, 14/7/45 (W.D.H.).

*L. albifrons* L. ♂♀, Boroughbridge, 14/7/45 (H.W.).

*Tinodes waeneri* L. ♂♀, Boroughbridge, 14/7/45 (W.D.H. and H.W.).

*Plectrocnemia conspersa* Curt. ♂♂, Hebden Bridge, 11/8/45 (W.D.H.).

*Cyrnus trimaculatus* Curt. ♀, Boroughbridge, 14/7/45 (W.D.H.).

*Philopotamus montanus* Don. Ingleton, 1-4/9/45 (J.R.D.).

*Rhyacophila dorsalis* Curt. ♂, Hebden Bridge, 11/8/45 (W.D.H.).

*Glossosoma boltoni* Curt. Robin Hood's Bay, 20/6/45 (J.M.B.).

*Agapetus fuscipes* Curt. Robin Hood's Bay, 15/6/45 (J.M.B.).

**Odonata** (J. M. Brown) : Dragonflies do not seem to have been so plentiful as usual this season, but the following were noted during the fine spell of weather in autumn : *Aeshna juncea* L., 5/10/45, 7/10/45 ; *Sympetrum striolatum* Charp., 25/9/45, 7/10/45 ; *S. danae* Sulz., plentiful, 5/10/45 ; but *S. flaveolum* L., which was seen last season, was not observed this year.

Since this note was written Mr. N. W. Harwood, of 14 Cedar Grove, Redcar, states in *The Entomologist* that *S. flaveolum* was seen at Guisborough, August 24th, and at Kirkleatham with *S. sanguineum*.

**Coleoptera** (G. B. Walsh) : Owing to various reasons—advancing years, ill-health, pressure of other duties, etc.—our members have not done as much work as usual during the past year, but there is a general consensus of opinion that the season has been a very poor one for beetles. On the occasions on which your Recorder has been able to collect in the Scarborough district, Coleoptera of all species observed have been decidedly scarcer than during even the 'lean seven years' through which we have passed. Mr. Bayford records Coccinellidae as being scarce in the Barnsley district, and Mr. A. E. Winter states that species of *Geotrupes* have been scarce in the Knaresborough district for the past year ; in this case Mr. Winter suggests the probable cause as being the ploughing up of old grass land. The most interesting capture of the year has undoubtedly been the discovery in North Yorkshire of *Cryptohypnus sabulicola* Boh., this being new to the county (Cooper, 1945, *Ent. Mon. Mag.*, **81**, 133). Other species worthy of note are *Grammoptera holomelina* Pool., taken by Mr. Dibb at Gateforth, *Notiophilus rufipes* Dej. (Gateforth), *Tachyporus macropterus* Steph. (Gateforth), *Cerylon ferrugineum* Steph. and *C. histeroides* Fab., *Cis alni* Gyll., *Aphodius distinctus* Mell., *Lochmaea capreae* L., *Brachytarsus nebulosus* Forst., all from Gateforth, near Selby (V.C. 64). Mr. J. H. Flint records *Bembidion obliquum* Sturm. from Leathley, *Aphodius lapponum* Gyll. and *Otiorrhynchus dubius* Str. from Beamsley Beacon. Mr. A. E. Winter has taken *Bembidion 5-striatum* from Scotton, *Triplax aenea* from Bolton Woods, *Silpha sinuata* from Scotton, and also from Scotton, *Bembidion paludosum*, *Orchesia micans*, and *Orsodacne cerasi*. Mr. W. D. Hincks records from Askham Bog *Anobium fulvicorne* (C. Large), *Dromius sigma*, nine specimens (W. Sanders and W.D.H.) ; this was first recorded from Askham in 1830 by A. Wright, and almost a century later by W. E. Sharp. From Pocklington Canal was taken *Donacia cinerea*, a new station for this uncommon species. At the Wykeham excursion Messrs. Hincks, Picken and Walsh took *Lochmaea crataegi*, *Henoticus serratus*, and *Cantharis abdominalis* var. *cyanea*.

**Lepidoptera** (Robert Procter) : Reporting on the district around Robin Hood's Bay, Mr. J. M. Brown states : 'The most striking feature of the season about Robin Hood's Bay has been the relative paucity of butterflies during the summer and the extraordinary abundance of Small Tortoiseshell and Red Admiral butterflies and of *Plusia gamma* moths during late September and early October ; also the occurrence of the Humming-bird Hawk Moth in some numbers.'

Mr. B. A. Cooper writes in regard to the migrants : Pierids—no definite migrations noted though watched out for. *Pieris brassicae* less common than usual. *P. rapae* more than last year. *Vanessa cardui* scarce, but much commoner than during past few years. *V. atalanta* scarce in first brood, but native bred second brood exceedingly common—commoner than *V. urticae* during September—but migrating south in numbers during latter half of September, very few left now (early October). *Plusia gamma* less common than last year in May and June, but native bred brood exceedingly common in August, September, and October, much more so than last year. *P. porphyrea* (*saucia*) exceedingly common compared with previous years. I reared one from larva found on beans. *N. c-nigrum* present but not seen commonly. *Nomophila noctuella* much more common than usual in June, but have seen none since. *Plutella maculipennis* appeared in great numbers extra early this year (about April 20th), second brood in late May and June also much more numerous than normal, but brood now out is not over common. Severe damage to turnip fields has been reported from the Wolds due to the larvae of this moth in July.

The following brief notes are compiled from reports kindly sent me by Messrs. E. G. Bayford (Barnsley), J. M. Brown (Robin Hood's Bay), M. D. Barham (Leeds and Pickering), C. A. Cheetham (Austwick), B. A. Cooper (Northallerton), J. R. Dibb (Leeds and Selby district), D. M. Jesper (Harrogate), and W. E. L. Wattam (Newsome, Huddersfield), to whom my thanks are due.



- T. jacobaeae* L. Imagines seen High Hoyland, 7/4; larvae abundant, 6/8; larvae, Allerthorpe, 7/7.
- P. fuliginosa* L. Less common than usual, Northallerton; Ilkley.
- A. plantaginis* L. Normal numbers, Northallerton.
- A. caja* L. Below previous years, Leeds.
- H. prasinana* L. Larvae, Temple Newsam, September.
- A. leporina* L. Three larvae on Birch, Temple Newsam, 18/7.
- A. megacephala* Fab. Very few larvae seen, Beeston; one larvae, Terrington.
- B. perla* Fab. Common, Northallerton; Pickering in July; very abundant near Lambton, Co. Durham, during July.
- N. typhae* Esp. Larvae plentiful, Fairburn Ings, 2/6.
- C. lutosa* Hb. Northallerton, 3/10.
- H. meticulousa* Hufn. Larva plentiful, but imagines rather scarce, Beeston.
- H. scolopacina* Esp. Single larva, Temple Newsam, 20/4.
- G. plecta* L. Adel, Leeds, Temple Newsam, but not common.
- O. citrargo* L. Larvae well below previous years, Temple Newsam.
- O. circellaris* Hufn. Plentiful, Northallerton; few, Leeds.
- C. verbasci* L. Larvae on Mullein, Northallerton; Aberford, near Leeds.
- P. vetusta* Hb. Single larva, Northallerton, in a bean field.
- P. aprilina* L. Very common this year round Leeds, numerous larvae seen resting on Oak trunks. One imago seen at Darley in Nidderdale, 7/10.
- P. chi* L. Very scarce this year, Beeston.
- P. flavicincta* Fb. Northallerton, 1/10, one female.
- M. persicariae* L. Larva in garden, Beeston, the first seen in district.
- S. libatrix* L. Larvae plentiful on Sallow, Askham Bog, 16/6.
- E. mi* Cl. Larvae abundant near Richmond.
- P. moneta* Fabr. Three specimens at light, Beeston, 21/7; larvae, Kirkstall.
- P. chrysitis* L. Common during June-July, Beeston; one in September, second brood.
- P. iota* L. Becoming much more plentiful round Leeds.
- P. gamma* L. Abundant everywhere, especially in September and October.
- P. interrogationis* L. Much commoner than last year on moors in North Yorkshire.
- C. nupta* L. Reported in Yorkshire by C. L. Jones (*Entomologist*, December, 1944).
- O. antiqua* L. Common round Leeds, Northallerton, and Wakefield.
- P. virgularia* Hb. = *seriata* Schrank. Common, Northallerton.
- P. aversata* L. Common, Northallerton, Beeston.
- G. papilionaria* L. Larvae Wakefield, Temple Newsam, Rawdon near Leeds. One imago caught at Allerthorpe, 7/7.
- C. coronata* Hb. Newly emerged ♀, Chevet Park, Wakefield, 9/6, R. Procter.
- E. venosata* St. Rather plentiful this year, Beeston.
- E. linariata* Fb. One specimen, Beeston, September.
- H. immanata* Haw. Melanic form, Adel Dam, Leeds, 26/5.
- H. suffumata* Hb. Common, Aberford, 20/5.
- X. ferrugata* L. Abundant, Newbridge, Pickering.
- B. parthenias* L. Two larvae, Seckar Wood, 9/6.
- A. grossulariata* L. Exceedingly abundant in larval stage, Beeston; common, Northallerton.
- A. sylvata* Scop. Saw Woods, near Leeds.
- E. alniaria* L. One specimen, Ingleton, 3/9, J. R. Dibb.
- P. duplaris* L. Again plentiful at Temple Newsam (melanic form).
- P. flavicornis* L. Larvae fairly common on Birch, Sekar Wood, 9/6.
- M. stellatarum* L. One seen, Chapeltown, Leeds, 26/7; several, R.H.B., 25-30/7. Mr. Wattam reports several in his garden after being absent for many years.
- D. elpenor* L. Larvae again abundant round Leeds; well-established at Newsome; maintains its numbers at Barnsley. Below average Harrogate area.
- S. convolvuli* L. Recorded from South Yorkshire by G. E. Hyde (*Ent. Dec.*).
- S. populi* L. Fairly common, Leeds; not uncommon, Newsome.
- S. pavonia* L. Allerthorpe, 7/7.
- N. dromedarius* L. Few larvae, Temple Newsam.
- N. ziczac* L. Single larva, Lewisham, 7/7; one, Leeds, September.
- O. camelina* L. Common, Temple Newsam.
- A. adippe* L. Allerthorpe, 7/7.
- A. aglaia* L. Fairly common, Pickering, Wykeham Low Moor, and Newton Dale

- during July. Very few seen on the cliffs, R.H.B., 12/7. Mr. Bayford reports seeing for the first time several large *Argynnis* in Barnsley, probably this species.
- A. euphrosyne* L. Common, Haugh Wood, Pickering.
- A. selene* Schiff. Normal numbers, Austwick ; not seen this year, Robin Hood's Bay.
- V. c-album* L. Recorded as being seen in Yorkshire by C. L. Jones (*Ent.*, Dec., 1944).
- V. urticae* L. In small numbers 17/3 to 19/4, more plentiful from 7/9 till mid-October, Robin Hood's Bay ; common round Leeds, September-October ; larvae abundant, August, Pickering ; fairly numerous, Barnsley.
- V. io* L. Several near Sheffield, 18/9 ; seen at Barnsley ; none seen Robin Hood's Bay.
- V. antiopa* L. E. W. Smith (*Entomologist*, December, 1944).
- V. atalanta* L. Very many records, more or less abundant, September and October, in all districts.
- V. cardui* L. Much more plentiful than usual although nothing like as common as *V. atalanta*.
- A. galathea* L. Scarborough, G. B. Walsh (*E.M.M.*, Dec.).
- P. megaera* L. Reported seen 14/8/45, Robin Hood's Bay ; also observed two or three years ago, Ramsdale, Robin Hood's Bay.
- E. janira* L. Below normal numbers, Barnsley ; not so plentiful, but recurring from 20/6-7/9, Robin Hood's Bay ; below previous years, Leeds.
- E. hyperanthus* L. Plentiful at Millington and Givendale in June ; numerous round Pickering.
- C. pamphilus* L. Only in moderate numbers at Newsome ; below average at Robin Hood's Bay ; none seen, Beeston ; Harrogate, July.
- N. lucina* L. Plentiful, near Haugh Wood, Pickering.
- T. rubi* L. Not seen this season, Robin Hood's Bay.
- C. astrarche* Bgstr. Common, near Haugh Wood, in July and August.
- C. phlaeas* L. Only in moderate numbers, Newsome ; from 16/5 till 4/8, but in comparatively small numbers, Robin Hood's Bay ; in less numbers than usual, Barnsley.
- L. argiolus* L. Bentham, 5/4, C. A. Cheetham.
- L. icarus* L. In small numbers, 20/6 till 17/8, Robin Hood's Bay ; fairly common, Pickering ; one specimen seen in Barnsley, the first one seen by Mr. Bayford in the town.
- C. croceus* Four (*edusa* Fb.). A single specimen, Kingston, Barnsley, J. E. Barker, 23/10.
- G. rhamni* L. Barlow Wood, near Selby, 22/4 ; Gateforth, 29/4 ; plentiful, Bishopwood, 23/3.
- E. cardamines* L. Several, Robin Hood's Bay, 4/5 ; common, Pickering, May ; Barlow Wood, 22/4. Three females in Mr. Wattam's garden at Newsome, the first time he has seen it in the district. Harrogate, a few in May.
- P. napi* L. Exceeding *P. rapae* in spring, Leeds. Autumn brood rather below usual numbers.
- P. rapae* L. About normal at Newsome in spring, the autumn brood not being greatly pronounced ; about average, Beeston.
- P. brassicae* L. See notes on *P. rapae*.
- H. tages* L. Rather abundant, Thornton Dale, May and June.
- P. thaumas* Hufn. Lewisham, 7/7, Hackness, 13/7, and Haugh Wood, -/8, Abundant at Allerthorpe, 7/7.
- P. sylvanus* Esp. Abundant, Askham Bog, 23/6 ; Robin Hood's Bay, 13/6, Allerthorpe, 7/7.
- Plodia interpunctella* Hb. Infestation of stored 'Peanuts' at Bramley, Leeds.
- Ephesia kühniella* Z. Larvae on stored barley, Leeds.
- Crambus pascuellus* L. Askham Bog, 16/6 ; Temple Newsam, 21/6.
- Nymphula stagnata* Don. Abundant, Temple Newsam, 1/8, along with *H. nymphaeata* L.
- L. quercus* L. r. *callunae* Pwm. About usual numbers on the moors.
- E. rubi* L. ♀ Allerthorpe, 7/7.
- Tortrix viburniana* Fb. Common at Askham Bog, 16/6.
- T. costana* Fb. Askham Bog, 16/6, W. D. Hincks ; Leeds, 2/7.

*Eulia ministrana* L. Abundant round Leeds.

*A. culiciformis* L. Still plentiful at Temple Newsam.

*C. myllerana* Fb. One specimen, Adel Dam, 26/5.

*Telphusa scalella* Scop.=*aleella* Fabr. Temple Newsam, 24/5. This is only the second record I can find of this moth in Yorkshire. R. Procter.

The nomenclature and order of species adopted is that of Meyrick in his *Revised Handbook of British Lepidoptera*, 1927.

## BIOLOGY

**Freshwater Biology** (H. Whitehead) : The season 1945 has not been a good one for winged aquatic insects, but in spite of this the Union's excursions to Allerthorpe Common, Boroughbridge, and Hebden Bridge resulted in the capture of specimens belonging to several species of Mayflies, Stoneflies and Caddisflies. Details are given in the reports of these excursions published in *The Naturalist*.

The Convener visited the Bramhope Ponds, near Leeds, on two occasions, and although winged insects were scarce, larvae and pupae of the caddis were fairly plentiful. Some of the pupae were bred out and the species obtained are given in the report of the Entomological Section.

An important contribution to the freshwater biology of our county is a paper by Mr. J. R. Dibb on 'The Yorkshire Mayflies or Ephemeroptera,' published in the *Transactions* of the Union in January, 1945.

Mr. J. M. Brown has continued his work on the aquatic hemiptera of the Robin Hood's Bay district, and sends the following report.

Five pools associated with farms in the Robin Hood's Bay district have frequently been worked for *Corixa*, and as the species taken seem to be constant the *Corixa* fauna can be regarded as stable. Six species occur in these pools, but there is a variation from pool to pool, and the distribution amongst them is therefore of interest. All are practically closed habitats.

- (A) A small roadside silt pool with muddy floor, very little vegetation and much fouled by cattle.
- (B) Very similar to A.
- (C) A pool in a disused quarry, used by cattle and much like A, but with more vegetation, and not so polluted.
- (D) A pool in the corner of a field, much shaded by trees, containing much decaying vegetable matter (dead leaves), with a considerable amount of vegetation. A detritus pool.
- (E) A roadside pool, larger than A, with a good deal of vegetation, a muddy floor and somewhat fouled by cattle.

SPECIES	A	B	C	D	E
<i>Corixa punctata</i> Ill. ...	×	—	×	—	×
<i>C. sahlbergi</i> Fieb. ...	—	—	—	D	×
<i>C. lateralis</i> Leach. ...	D	D	D	—	S.D.
<i>C. limitata</i> Fieb. ...	—	—	—	—	×
<i>C. nigrolineata</i> Fieb. ...	S.D.	S.D.	S.D.	×	D
<i>C. praeusta</i> Fieb. ...	—	—	×	×	×

D=Dominant.

S.D.=Sub-dominant.

×=Present.

—=Absent.

## OBSERVATIONS.

*C. lateralis* favours polluted water, and is generally dominant in such, but is not restricted to this type of habitat, being quite plentiful in 'clean' pools and even in some moorland pools. It is one of the most abundant species in the district.

*C. nigrolineata* is probably the commonest species in the district, occurring in almost all the pieces of water explored. It is frequent in polluted waters, often along with *lateralis* as sub-dominant. It is also found commonly in cattle troughs. It has been stated that these two species seldom occur together, that does not apply to this district.

*C. sahlbergi* seems to prefer detritus pools with vegetation and decaying leaves, and is frequently very numerous in these.

*C. punctata* is frequent in both types of pool, but not usually in very large numbers.

*C. praeusta* avoids the most polluted pools, though tolerating a degree of foulness.

*C. limitata* is sporadic and only found as isolated examples.

*C. castanea* Thoms. and *moesta* Fieb. still occur side by side in the same pool on the cliffs as reported last year, 27/2/45, 19/10/45.

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## YORKSHIRE NATURALISTS' UNION, GENERAL COMMITTEE

At the meeting of this Committee at Halifax on December 1st, 1945, the copy of the Rules and Constitution of the Union which had previously been distributed to the members, was duly adopted with the proviso that Vice-Presidents be inserted in the constituent membership of the Executive and General Committee.—C.A.C.

**Nature Study Talks for Youngsters**, by A. J. Mee, M.A., B.Sc. Pp. 104. Littlebury & Co., Ltd., The Worcester Press, Worcester, 8/6. This book consists of a collection of fourteen broadcast talks given by the author to schools. Each topic is complete in itself, and the subjects dealt with range from the habits of worms, wasps, spiders, lobsters and eels, to the form and function of teeth and feathers and the story of the evolution of vertebrate limbs. Forty-five illustrations are dispersed through the text, which retains the conversational style of the broadcast talks. The book may be recommended to any boy or girl interested in natural history, and particularly in animal life. Those with botanical leanings will find only one of the chapters devoted to plant life.



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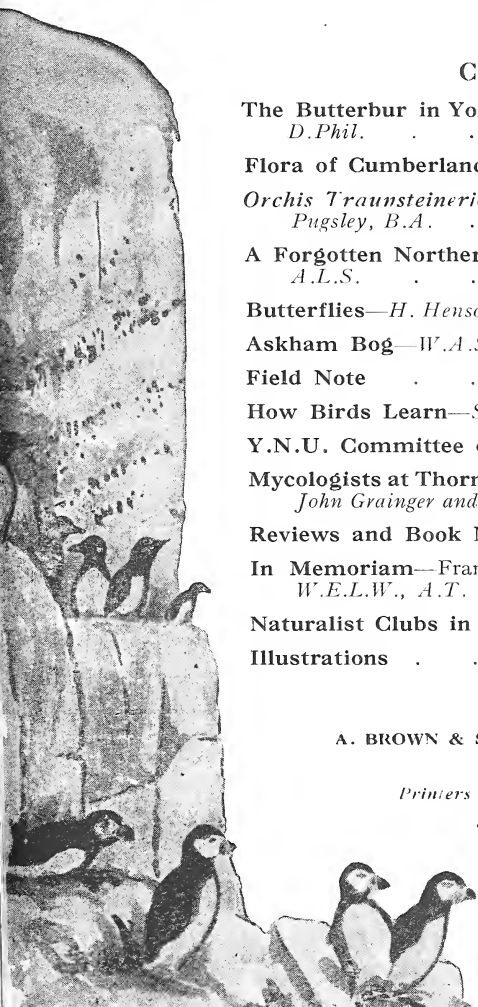
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## THE BUTTERBUR IN YORKSHIRE

D. H. VALENTINE, M.A., D. PHIL.

THE butterbur, *Petasites hybridus* (L.) G.M. & S. (*P. vulgaris*, *P. officinalis* and *P. ovatus* are synonyms), is found in all parts of the British Isles; but it is dioecious, plants being either functionally male or functionally female, and it is the male plant which is widespread. The range of the female plant is not nearly so wide either in Britain or on the Continent.

Attention was drawn to these facts by G. Nicholson (*Journal of Botany*, 1884) and they have since been confirmed by a number of investigators. Little is known, however, of the ecology of either the male or female plants, and the exact distribution of the female has not yet been plotted. It was to elucidate this problem that a study of the butterbur was begun before the war and the investigations are now

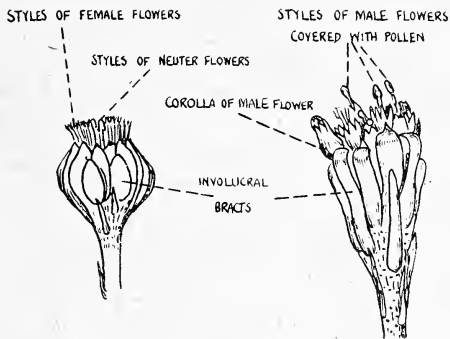


FIG. 1

FIG. 2

FIG. 1. SINGLE HEAD OF FLOWERS FROM  
FEMALE INFLORESCENCE. ( $\times 3$ )

FIG. 2. SINGLE HEAD OF FLOWERS FROM  
MALE INFLORESCENCE. ( $\times 3$ )

being continued; and it is because the headquarters of the female plant in Britain appear to be in Lancashire and Yorkshire that this note is written, in the hope that it will be of interest to readers of *The Naturalist*.

Though to most botanists the male plant is a familiar sight in springtime, the female may not be so well-known to many, and a brief description of the characteristic differences is therefore given here.

The male inflorescences are ovoid when young, later lengthening to a height of about six inches, but dying away when the flowers are over. The flower-heads of the inflorescence, which are numerous, each contain many flowers, all of the same kind (Fig. 2) with a five-pointed rose-pink corolla from which protrudes a thick blunt style covered with the pollen which it has swept the out of flower. The ovary of the flower is functionless and no seed is set.

The female inflorescences are at first ovoid and short like those of the male, and they come into flower at about the same time, viz. early spring. If, however, they are pollinated, they elongate enormously, eventually having a main stalk two or three feet high which bears numerous clusters of fruits with the greyish-white pappus typical of Composites; these fruiting heads are quite conspicuous. The heads of flowers before pollination are smaller and rounder than those on the male plant (Fig. 1) and contain two sorts of flower; the more numerous are purely female with an inconspicuous corolla and a slender bifurcate style, but one or two flowers in the centre of the head have the rose-pink petals typical of the male flowers, though here they are neuter, and neither produce pollen nor set seed. They do, however, produce nectar.

Distinct as are male and female plants when flowering, no difference in their vegetative structure has been detected.

The Yorkshire localities for the female plant, which I have collected mainly from floras and from British herbaria, are as follows :

Valleys of the Colne and Calder : Neighbourhoods of Halifax and Huddersfield.

Valley of the Aire : From Airton, through Cononley, Bradford (?) and Leeds to Castleford.

Valley of the Wharfe : From Bolton Abbey through Ilkley to Thorp Arch.

Valley of the Ure : From Jervaulx through Tanfield and Ripon to Borough-bridge.

Valley of the Swale : From Richmond to Bedale.

Valley of the Greta : Ingleton.

Most of the records are mentioned by name in this list, and it will be seen that there are many wide gaps, *e.g.* that between Ilkley and Thorp Arch. I have not been able to discover any records from the East Riding, or North-east Yorkshire.

In the British Isles as a whole, the available data indicate that the female plant is not uncommon in parts of Lancashire, Yorkshire and Derbyshire, and possibly also in Leicestershire. It is rare in Northumbria, the Lake District and Dumfries, and also in the Midlands and in the valleys of the Thames and Colne. Apart from a few scattered or doubtful localities it is not recorded outside the areas mentioned, and is apparently absent from Ireland. The male plant, on the other hand, is recorded from every part of Great Britain and Ireland, being as a rule commoner than the female when the two occur together.

In South Lancashire, where I have observed males and females in the same locality, good seed is normally set ; and I have obtained abundant viable seed by artificial pollination of potted plants. I have also raised a small number of plants from seed and have obtained approximately equal numbers of males and females. It appears therefore that some unknown factor, which may perhaps have to do with climate or soil, must intervene to prevent the spread of the female plant from its main centre in this country, the North of England. The wide distribution of the male plant, which by itself cannot produce seed, is explainable in a number of ways, of which planting by man is one ; but a full discussion of this and many other points relating to the butterbur cannot be entered on in this short note, and is postponed until further investigations have been made.

I should be most grateful to hear from naturalists of further localities for female butterbur in Yorkshire, to confirm old records and to establish new ones, and also to know their views on the ecology of the plant and particularly on the establishment of new colonies by seed. It is of interest that a German botanist (Steckhan) states that in parts of Central Europe, the female tends to occupy the wetter portions of the habitat when growing together with the male ; this point has not yet been fully investigated in Britain.

[The interesting distribution problem raised by Dr. Valentine in this article is one to which many readers of *The Naturalist* are in a position to offer material assistance. Members of the Botanical Records Committee of the Yorkshire Naturalists' Union and many others could render valuable service by paying particular attention to this problem. Enquiry from members of local natural history societies and reference to local herbaria as well as personal observations would surely yield much additional information helping to fill in the gaps in our knowledge of the distribution of the female colonies of butterbur, which are now in full flower. Other observations on the ecology of the plant and the presence or absence of seedlings in the vicinity of female colonies would be of equal interest and value. Observations and records should be communicated to Dr. D. H. Valentine at the University Science Laboratories, South Road, Durham.—EDITOR.]

## FLORA OF CUMBERLAND

NEARLY fifty years have elapsed since the publication of W. Hodgson's *Flora of Cumberland* and in the intervening time much additional information has accumulated. We are glad to hear therefore that the Carlisle Natural History Society has begun work on a new flora of the county which will include mosses, liverworts and lichens as well as flowering plants and ferns. The Society would welcome all notes, records or specimens bearing on this project and these should be forwarded to Miss C. W. Muirhead, Public Library and Museum, Carlisle. We wish every success to this work and hope it will receive widespread support.



# ORCHIS TRAUNSTEINERIOIDES PUGSL. IN BRITAIN

H. W. PUGSLEY, B.A.

In August, 1936, my paper describing a new Irish sub-species *Traunsteinerioides* of *Orchis majalis* Reichb. was published in the *Proceedings of the Linnean Society of London*; and in February, 1939, further notes on this plant and on *O. latifolia* var. *eborensis* Godf. (which was referred to it as a variety) were printed in *Journ. Bot.* lxxvii, 54. The plant was subsequently raised to specific rank as *O. Traunsteinerioides* (*Journ. Bot.* lxxviii, 179 (1940)).

I visited the two original stations in Wicklow early in June, 1939, in company with Mr. J. P. Brunner and saw over one hundred plants in flower at Ballyman Glen and nearly as many in the Newcastle Marshes. No other Marsh Orchid was noticed in the former locality, but at Newcastle a few individuals of *O. latifolia* L. (*O. incarnata* auct.) were observed. The Newcastle specimens of *O. Traunsteinerioides* were larger, on an average, with more floriferous spikes, than those at Ballyman, perhaps owing to the wetter habitat. Plants with spotted and with unspotted leaves occurred at both places. The populations seen agreed well with the original description and figure, but the stems were generally only slightly flexuous, the leaves little recurved, and the flower-spurs somewhat thicker than those depicted in the plate.

I had previously collected in June, 1937, an allied form in a marsh near Odiham, in North Hants, where it was growing in some quantity with a few individuals of *O. praetermissa* Dr. in the vicinity. This plant seems to differ from typical *O. Traunsteinerioides* only by its rhomboidal rather than deltoid labellum and closely resembles the Yorkshire variety *eborensis*. *O. latifolia* and *O. incarnata* are recorded for this neighbourhood in Townsend's *Flora of Hampshire*.

A further station for this species is Cothill Marsh in Berkshire. In the summer of 1943 I saw a large number of specimens that had recently been gathered there and at once recognised *O. Traunsteinerioides*. Similar examples were subsequently sent me by Professor A. R. Clapham, and last June (1945), while staying at Oxford, I visited the locality and found the plant still in considerable numbers though it had been extensively collected. The only other Marsh Orchid noted here was *O. latifolia* L. in very small quantity. Round the margins of the wet ground there was a fair number of *O. maculata* L. (*O. Fuchsii* Dr.). The majority of the specimens of *O. Traunsteinerioides* exactly matched the Wicklow form and showed the same variations, but some plants, especially towards the edge of the marsh, had more heavily spotted foliage and a more strongly marked labellum. This might possibly be due to crossing with the *O. maculata* growing near by. Druce, in the *Flora of Berkshire*, gives both *O. incarnata* and *O. latifolia* for Cothill, as well as a hybrid with *O. maculata*. *O. Traunsteinerioides* was probably his *O. latifolia* of that place and date.

When seen together in the herbarium the specimens of *O. Traunsteinerioides* from the British localities in Wicklow, Yorkshire, Berkshire and Hampshire bear a striking resemblance to each other and contrast strongly with the other British Dactylorchids. Their affinity with *O. Traunsteineri* Saut. is very obvious. The principal differences from the Bavarian and Swiss forms of the latter lie in their rather taller and more robust habit, with somewhat broader though the same sparing foliage and a more floriferous and denser spike of flowers. The normal spikes are 8-20-flowered, but the number sometimes reaches thirty in luxuriant plants. Sauter (*Flora of Bodensee*, etc., in *Flora*, Bd. i, 36 (1837)) states that the spikes of *O. Traunsteineri* bear 6-12, rarely twenty flowers. I have specimens from Ahlbeck, in Pomerania, sent out as *O. Traunsteineri*, that are more robust than the typical species and closely resemble the British plant, except that their spikes are shorter and they apparently have unspotted leaves and lighter flowers.

Until recent years *O. Traunsteinerioides* has been overlooked in Britain, just as *O. Traunsteineri* has been passed over in France. Rouy (*Fl. Fr.* xiii, 150 (1912)) says of the latter, 'Plante encore peu connue et dont les localités sont parfois incertaines.' On the other hand, this group appears from Ascherson and Graebner's 'Synopsis der Mitteleuropäischen Flora,' Bd. iii, 722 sq. (1907), to have been intensively explored in Germany and Eastern Europe. The habitats of *O. Traunsteinerioides* at Newcastle (Wicklow), Odiham and Cothill are very wet marshlands; those at Ballyman Glen (Wicklow) and in Yorkshire are less swampy.

## A FORGOTTEN NORTHERN BOTANIST

W. WATSON, D.Sc., A.L.S.

SOME time ago a copy of Bohler's *Lichenes Britannica* (1835-37) was unearthed by Dr. S. Peyton, the Librarian at Sheffield University. In view of the fact that none of the better known science libraries seemed to have a copy, it was sent to me by Professor Pearsall for examination. It consisted of 16 fasciculi, each containing short descriptions of eight or more lichens represented by specimens or plates. Most of the specimens were presumably collected by Bohler himself but, by indirect evidence, Deakin and Borrer were responsible for some of them. The number of actual specimens was 113, and 17 others were represented by plates. Five of the specimens were too incomplete for definite determination, four are not now considered to be lichens, and 19 are incorrectly named. Nine specimens are given according to the nomenclature of his time, but require emendation to accord with that of the present day. For instance, *Parmelia olivacea* is not used in the limited sense as it is to-day, but includes other species. Bohler's specimens consisted mostly of the much commoner plant, *Parmelia fuliginosa*. Similarly many of the *Cladonia* species require emendation.

In most cases each particular lichen in all the copies of the fasciculi distributed is represented by material collected from the same place. I have had access to three different lots and found this to be so. When such material was incorrectly named every example was wrong, thus No. 102 is given as *Lecidea incompta* (= *Bacidia incompta*), but Bohler's specimens in two exsiccati I have examined are *Buellia myriocarpa*, and A. L. Smith in *Monograph British Lichens*, Pt. II (1926), p. 185, states that 'Bohl. n. 102' is *Buellia myriocarpa*. This method of dividing the material up resulted in some specimens consisting of small and incomplete scraps. Considering the difficulties of the study and determination of lichens at the time, the mistakes were not many and doubtless Bohler's work provided a stimulus to the study of these difficult plants, which were then considered as little more than the 'trash of vegetation,' as Linnaeus earlier styled them.

Bohler contributed the lichen list to Howitt's *Flora of Nottinghamshire* and wrote the 'Flora' portion of Aveling's *Roche Abbey*, which was later embodied in the *Flora of West Yorkshire*. The flora of Sherwood Forest in White's *Workshop*, and an account of the fungi of the Doncaster district in the *Phytologist* of 1857 were also due to him.

As he lived for some time in Sheffield, enquiries made there yielded the information that he had some reputation as a herbalist and botanist. I am indebted to Dr. Peyton for the following interesting précis of an article by John Holland entitled 'Cheap Tommy' in *The Reliquary* (1870-71), Vol. XI, p. 212.

A man known by the above name for 70 years was accustomed to visit the villages of N. Derbyshire with his barrow of pedlery. Cheap cutlery was a prime item of his commerce. John Bohler was born, I believe, at S. Wingfield on the last day of 1797. He commenced work as a stocking weaver but manifested an early instinct for identifying and collecting the wild plants of the neighbourhood. As he grew up he collected plants which retained a reputation for their virtues and the vegetable alkaloids of the modern *Materia Medica*.

In this pursuit he rambled over the United Kingdom and there was hardly a rare and saleable medical plant of which he did not know the reputed use and habitat.

Out-growing the patronage of the doctors he became an accomplished field botanist and was not only acquainted with every one of our indigenous plants and with the haunts of the rarest, but with amateur and professional devotees of the British flora. Addressing himself more especially to the study of cryptogamous plants he published *Lichenes Britannica*. A few years since he explored the Snowdonia range in connection with a Botanical Committee of the British Association.

The first edition of the *Biographical Index of British and Irish Botanists* incorrectly gives his life-period as 1796-1872, but this is corrected in the second edition to 1797-1872, where it is stated that he was born on December 31st, 1797, and died at Sheffield on September 24th, 1872. A brief note in the *Journal of Botany* (1872, p. 384) adds that he was a bryological correspondent of William Wilson and John Nowell and had an excellent knowledge of both the flowering plants and cryptogams of West Yorkshire.

Books about butterflies probably exceed in numbers those about any other British insects but Dr. Ford's book\* is not just another one. It is new; new in outlook, new in method of treatment, new in subject matter, and new as regards standard of production. It is a book which every butterfly collector, in fact every entomologist, will have to possess. A mere list of contents would awaken interest but the delight within its pages is better shown by the fact that the reviewer, by no means a butterfly enthusiast, found it almost impossible to put it down before it was finished.

In the first chapter there is a history of butterfly collecting in England in which the author succeeds in capturing all the romance of the old naturalists. One can walk with him in seventeenth-century English woodland, seeing brilliant fritillaries by the score and perhaps effecting a desperate capture of a Purple-edged Copper. A 'Plate' of historic butterflies is intriguing in the extreme, a Bath White of 1702 with antennae still complete is shown as probably the oldest butterfly still in existence. The second and third chapters require a little more effort but there is much to interest even the expert on the subject of butterfly senses and on the question of the colouring matter of the wings. Who could resist fuming a Marbled White with ammonia or carrying out the suggestion contained in the lines 'if the uncoloured pupal wing be dissected out, dried, and viewed in a slanting light, a ghost of the future pattern appears on it as if etched on glass?'

Lest the reader should think the book is getting too far from the traditional outlook of the lepidopterist the author returns to the subject of classification and collection arrangement. Skilfully using the information on structure just provided he demolishes the old classificatory systems and recommends a much more scientific arrangement which should override the most stubborn conservatism.

The association of the 'Blue' butterflies with ants is a remarkable story. Twenty-five years ago the later larval stages of the Larger Blue were unknown and only some very gifted naturalists suspected the truth. F. W. Frohawk and E. B. Purefoy performed a notable feat in showing that after its third moult the larva of *arion* feeds on vegetable matter no more. Instead it supplies ants with glandular exudations and in return is carried to the ant's nest where it attacks and devours the ant larva, a diet on which it completes its growth.

Next comes a wealth of natural history related to the distribution and occurrence of our species, with a strong suggestion that vigilance may be rewarded even in this, the most thoroughly worked field in butterfly lore. The fact that the Chequered Skipper could pass unobserved in Inverness until 1941 lends force to this suggestion as also does Dr. Ford's clear optimism that *Erebia ligea* may yet turn up again in Scotland and *E. epiphron* (sub-species?) be captured once again in the mountains of Mayo and Sligo. It is also clearly important to record the occurrence of the Comma, the Peacock, the White Admiral, and the Large Tortoiseshell, all of which seem to be extending their range.

Absorbing reading is provided by the story of the re-introduction of the Large Copper into some of our fens; whilst the account of the deliberate destruction of introduced colonies of *Araschnia levana* by a collector with a phobia against foreigners leaves one astonished at the emotional possibilities of the lepidopterist.

The chapters concerned with butterfly genetics are full of interest, and give all the necessary information by which amateur naturalists can do valuable breeding work by determining the genetic relationships of their varieties to the more usual forms.

The final chapter, illustrated by distribution maps, on the prehistoric colonisation of our islands by butterflies gives much meaning to the study of geographical distribution, quite apart from the more usual considerations of climate and habitat.

The only criticism of the book could easily be obviated in a new reprint. The plates are difficult to find from the references; a reference such as 'Plate —, p. 114' would be much easier than mere quotation of the plate number. The method of labelling the plates was also found to be a trifle tiresome. It would be preferable, if it is typographically possible, to put all the information about the specimen under its number on the explanation page instead of at its foot.

One cannot but offer the highest possible praise to the production of this book. The illustrations are well chosen and superbly executed. It is a book which will

\* BUTTERFLIES by E. B. Ford, M.A., D.Sc. Pp. 368 with 48 plates of colour photographs, 14 plates in black and white, 32 distribution maps and 9 other diagrams. Collins, 16/-.



not become out of date in our generation and will surely run to many reprints, although a new edition is hardly likely to be necessary for many years. If the rest of the 'New Naturalist' series reaches the standard of this its first volume the editors, James Fisher, John Gilmour, Julian S. Huxley and L. Dudley Stamp, will have collaborated most effectively with enlightened publishers to produce volumes of inestimable value to students of British natural history.

### ASKHAM BOG

In recent years there has been a widespread increase in the teaching of biology in boys' schools where botany and zoology can now claim equality in status with chemistry and physics. This tendency might have been expected to result in an increase in the number of young naturalists though if the number of boys seeking membership of local natural history societies is any guide there is but small evidence of any such general increase. The preparation of candidates for examinations in biology and the inculcation of a love of the countryside and a thirst for knowledge of the animals and plants which populate it are too widely different matters, and the latter requires something more than mere scholastic competence. It has been a tradition in the Bootham School, York, to foster this love of natural history in its pupils long before the biological sciences came to the fore as subjects for inclusion in science curricula. The late R. Miller Christy and H. Stuart Thompson spring to mind as two well-known naturalists who were pupils at the school and James Backhouse, Jnr., though he probably owed most to his father, doubtless also owed much to his schooling here for the development of those faculties which made him such an acute observer and successful field botanist.

For over a century there has been an active Natural History Society in the school. Its energy and enterprise have recently found expression in the production of a report on the natural history of Askham Bog. In 1879, three of the Bootham schoolmasters, J. E. Clarke, B. B. Le Tall, and J. W. Graham, assisted by local naturalists, made a detailed survey of Askham Bog and published a report on their work in the *Natural History Journal*, a magazine which recorded the leisure-time activities in Friends' Schools. Last year Mr. Clifford Smith the master now in charge of biology initiated a scheme for the reinvestigation of the area by the members of the School Natural History Society. Nearly a hundred boys entered enthusiastically into the scheme and botanical, ornithological, and entomological teams were formed.

Observers worked in pairs and each week throughout the period of the survey, which covered the school terms of 1945, one pair from each team visited the area at least twice. At the end of the work reports were drawn up by each group embodying the observations and records of its members with remarks on any significant differences as compared with the 1879 survey. These sectional surveys preceded by a foreword by the headmaster, a brief topographical introduction and a section on the geology of the area (which attracted only one worker), have been collected into a single typescript report of some sixty foolscap pages. Apart from direction and organisation the report is almost wholly the work of the boys themselves. As such, it reflects great credit on all concerned and is indeed a remarkable year's achievement.

It is only to be expected that the work of a group of inexperienced naturalists should contain errors of identification and omissions and in referring to some of these no reflection is intended upon the quality of the work as a whole which we consider highly praiseworthy. It is particularly in the long list of flowering plants that botanists familiar with Askham Bog, will notice several improbable and a few impossible entries. The Umbelliferae especially appear to have given trouble in diagnosis, probably due to their collection without fruits, and four of the species listed, viz., *Cicuta*, *Sison*, *Foeniculum* and *Carum Petroselinum* are certainly incorrectly named, while *Sium latifolium* is more likely to be the commoner *S. angustifolium* which is omitted. *Aethusa Cynapium* seems a highly improbable species to occur commonly if at all in any part of the bog proper. *Apium inundatum* is omitted and *Oenanthe aquatica* was almost certainly gathered and wrongly referred to some other species. Amongst the Compositae too *Anthemis Cotula* and *A. nobilis*, *Helminthia Echioides* and *Picris Hieracioides* are surely errors as are certainly *Prunella laciniata* and *Calamintha vulgare* among the Labiates. It would be an ecological paradox to find *Scabiosa arvensis*, *Galeopsis Ladanum*, *Anthyllis Vulneraria*, *Euphorbia Peplus*, *Hypericum perforatum* or *Rubus saxatilis*



in the bog itself, yet all these species are listed from the Jungle or the Far Wood (the last two were recorded also by Le Tall in 1879), and none is classed as less than occasional in the grade of relative frequency. One notes also the inclusion of *Lychnis alba*, but the omission of *L. dioica* and that *Rhamnus catharticus* is classed as common but *R. Frangula* only occasional, whereas the latter is unquestionably much the more plentiful of the two.

Some of the specific names employed are to be interpreted in a comprehensive sense; thus *Viola canina* no doubt refers to *V. Riviniana*, and *Polygala vulgaris* to *P. serpyllifolia*, while *Epilobium roseum* is more likely to be *E. obscurum*, and *Salix caprea* to be *S. atrocinerea*. The Oxlip encountered in Far Wood was the Primrose-Cowslip hybrid, *P. variabilis*, and not the true Oxlip, *P. elatior*, which does not grow in Yorkshire. Less excusable is the inclusion of *Salix herbacea* which is limited to the summits of our highest mountains. This presumably refers to *S. repens*. But what can the plant identified as *Vaccinium uliginosum* have been?

It would be interesting to know what is intended by *Orchis incarnata* which is said to be 'very rare' and to occur in the Far Wood. Evidently this is not the plant which has for so long passed under that name and which is now known as *O. latifolia* as under the correct name *O. latifolia*, reference is made to the colonies of that species which occur in the boggy field on the south side of the wooded portion of the bog. Le Tall also recorded two marsh orchids and his *O. latifolia* which he said was much rarer than *O. incarnata* was probably *O. purpurella* as the writer once found a specimen of this in open ground on the north side of the bog. But one would not expect to encounter *O. purpurella* in the Far Wood.

It is hardly surprising that with so many other plants to identify, no serious attempt was made to cope with the sedges, rushes and grasses. Only four grasses and the same number of rushes are listed from the bog proper with a few more grasses included from the surrounding fields. The very rich sedge flora, to which B. B. Le Tall added *Carex elongata* in 1892, is virtually untouched with no reference even to *Carex paradoxa*, one of the botanical treasures of Askham Bog and probably as abundant there to-day as it ever was. Of the five species of *Carex* named *C. limosa* is certainly incorrect and probably refers to *C. panicea* or *C. flacca*, while for *C. caespitosa* either *O. Goodenowii* or *C. stricta* is intended.

In the section devoted to plant ecology, some quantitative data are given for soil organic matter and pH values for different areas and a few metre quadrats made in typical Birch and Reed Swamp areas of the Nearer Jungle. More detailed and comparative ecological observations would be of great interest. The Far Wood especially would repay investigation for unlike many regions of the Jungle, where lack of fencing has allowed cattle to gain entry, a factor the importance of which is underestimated, the vegetation here is quite unaffected by grazing and provides one of the most interesting areas of its kind for ecological work in the north of England.

The ornithological section of the survey gives the comparative status of species observed with that of the year 1879. Some of the changes that have taken place were to be expected having regard for events elsewhere (although the Magpie is stated to have decreased); others no doubt have followed the reduced water content of the area due to drainage.

For an accurate estimate of the avian population of any area, much depends on the ability of the observers to recognise calls and songs, without which some species may easily escape notice. How far the observers had the advantage of this quality is not clear; but they would probably have found it advantageous to have the company of someone tolerably expert in this connection to enable students to learn the more obvious notes at some field meeting in May or June. Goldfinch and Lesser Redpoll have not decreased of recent years generally but were not recorded for the area in 1945 although given as common in 1879.

The fact that the Linnet formerly bred numerously and is now a rare visitor may possibly be due to such ecological change as the loss of an area of gorse, or of low thorns by growth, away from one of which the species is seldom numerous, except on marram dunes and along low hedgerows.

One is surprised that the observers of 1879 found the Tree-Pipit to be a rare breeder, although the drier ground of to-day, and possibly the growth during the intervening years of tall trees, may have bearing on it. In 1879, the Willow-Tit had not been separated from the Marsh-Tit, but the present ecological report shows the area to be one in which the Willow-Tit might well be expected to-day.

The Great Spotted Woodpecker, stated to have increased, is certainly the commonest woodpecker in Yorkshire to-day. The Little Owl, naturally not mentioned in 1879, is said now to be a visitor from the adjacent Acomb Woods, although holes and roots and banks about hedgerow and open timber are more typical breeding sites. The disappearance of the Long-eared Owl is paralleled in other areas where it was common only twenty years ago, as are also the present occurrences of Turtle Doves and Tufted Ducks, neither of which was noted in 1879.

A table of foods of birds differentiates between 'land insects,' 'air insects,' and 'insect larvæ.' Tits and Wrens are shown as feeding on the first-named group only, whereas actually they also feed commonly on larvæ. It is also curious that the Skylark should be shown as feeding on 'air insects' whereas the species mainly feeds on the ground, taking larvæ readily as well as seeds. To bracket 'Hedge and Tree Sparrows' as feeders on 'seeds, seedlings and shoots' is anything but scientific; and probably the House Sparrow is intended instead of *Prunella*.

The entomological contributions to the survey consist of a report on the butterflies and short notes on moths and dragonflies. There is also a negligible reference to insects in the invertebrate report under the 'Animal-life' section in which the vertebrate and molluscan faunas are briefly dealt with. Although Askham Bog is not a good locality for butterflies the entomologists were well advised to concentrate most of their efforts towards a full report on this small group rather than disperse their energies over a larger field. They were also well advised in adopting Ford's fine new book *Butterflies* as their standard work. Twelve species are listed as occurring in 1945 and one doubtful. Ten species included in the 1879 list were not seen. Of these the Greasy Marsh Fritillary and the Purple Hairstreak have not been seen in the district for many years. Some of the others were no doubt missed owing to the break in observations during the summer holiday.

The short list of dragonflies owes its brevity to the departure of its compiler before the season was far advanced. Such a prominent Askham Bog species as *Elibellula quadrimaculata* which sometimes occurs as early as May should have been noted; *Aeschna grandis*, so plentiful in the bog, however, does not appear before the end of July. The writer has never seen *Cordulegaster boltonii* at Askham and would not have expected the locality to be a suitable one. If, as we hope, this work is continued in future years it is suggested that insect groups should be selected for study which include species more typical of the bog, such as the water-beetles, water-bugs, chrysomelid plant-beetles, hover flies, or even Coleoptera as a whole.

The presentation of the data assembled in the survey is excellent, and as already stated, the report as a whole deserves high praise. But although it possesses considerable intrinsic merit there is no doubt that a more valuable feature and one which Mr. Smith will have had most at heart is the training of the members of his team in patient and independent observations and methodical recording of what they have observed. Its greatest value can only be judged by the permanent effect which the work has upon the outlook of its collaborators. Some—perhaps many—of them will in the course of their work have acquired an enduring interest in natural history which will bring untold satisfaction and pleasure in years to come. It is from such material that we can look for the first-class naturalists of the future. To kindle and stimulate the interest of boys in field work and to discipline and direct their energies along proper lines is surely to do a service to natural history. How better could it be attempted? W. A. S., R. C., W. D. H.

**Bryological Notes from the Halifax District.**—While collecting, last year, at Higher Greenwood, Hardcastle Crag, Hebden Bridge, a cliff by the river-side yielded *Lophozia badensis* (Gottsche) Schiffn., an hepatic not previously recorded for the Halifax parish. This is regarded as a calcicolous species and associated with it was the calcicolous moss *Weisia verticillata* Brid., not previously recorded for Hardcastle Crag. The material upon which the plants were growing gave a positive reaction with acid. The cliff forms part of an outcrop previously known as Yoredale now included in the Grit series.

The hepatic *Leptoscyphus anomalus* (Hook.) Mitt., recorded for Stansfield Moor as *Mylia anomala* in the *Halifax Flora* by J. Nowell in 1842 and 1862, I have collected at Skirden Clough, Ogden, near Halifax. Dr. W. Watson has kindly confirmed these records.—H. WALSH.

## HOW BIRDS LEARN

STUART SMITH, PH.D.

BIRDS normally acquire the ability to carry out the many operations essential to their successful existence, in two ways. They are either born with a particular ability, or they have to learn to do certain operations as they grow up. In the former, they differ—as do most animals—from man, practically all of whose operations have to be learnt, many of them by slow processes of repetition under expert guidance. The two methods by which birds acquire knowledge to carry out operations may be termed 'inheritance' and 'imitation.' Certain of a bird's capabilities are truly inherited. Thus no bird ever needs to *learn* how to build its own specialised nest. Nest-building is an entirely instinctive accomplishment, and a young bird removed from the nest and hand-reared quite away from all contact with other birds, will retain the ability to construct a perfect and characteristic nest.

But when we come to consider other accomplishments, such as for example, the ability to sing a characteristic song, we find that this is by no means invariably an instinctive acquirement. Thus while in some song birds, the young will sing the normal song of the species through a completely inherited faculty, in others, the young have to learn the song, through hearing adult birds of their own species singing around them and by imitating their notes until the song is learned. Examples of the first type (that is, complete inheritance of song-pattern) are afforded by the blackbird, chiff-chaff and grasshopper warbler. The song-thrush also tends to come into this category, though experiments have shown that its environment will at times modify its song. Other birds have definitely to learn much of their song from adults belonging to their own species, and in this category we can place the robin, whitethroat, tree and meadow-pipits, greenfinch, linnet, chaffinch and skylark. If young male tree-pipits or meadow-pipits are removed from the nest and reared in isolation, they will sing a 'song' not unlike the grasshopper warbler in the case of the tree-pipit, or the serin-finch in the case of the meadow-pipit. An untaught chaffinch sings an abbreviated song like that of the lesser whitethroat. A whitethroat and a linnet reared together both developed similar songs, resembling a mixture of a robin's and a skylark's. There is no rule governing the types of song which belong to the two categories, and while superficially one might suppose that the simpler songs would be innate and the more elaborate ones those which had to be learnt, this is not so. Thus the simple song of the chiff-chaff does not have to be learnt, but neither does the more elaborate one of the blackbird. The rattle of the chaffinch is not inherited, but the rich melody of the blackcap is for the most part, innate. All we can say about the inheritance of the song faculty is that there is a general *tendency* for birds to sing the normal song of the species. Thus, a nightingale which was reared by a foster parent of another species, sang the song of that fosterer, but reverted to the true nightingale song next year when placed with members of its own species. In general, call-notes as distinct from true song, are innate, although in certain finches, some or all have to be learned by imitation.

A great deal of learning in young birds is derived from a very strong instinct on their part to follow their parents and imitate their actions. This 'following-instinct' has been shown experimentally by Lorenz to be governed by visual 'imprinting,' in which a visual pattern of the first living object seen by the newly-hatched chick is strongly and indelibly imprinted on its consciousness. Since under natural conditions this object is always the parent bird, the young birds have an urge to follow their parents about, and to imitate their actions. In this way, the ability to peck-up food, dive under water, and possibly also, to fly, are acquired by imitation. Grebes 'teach' their young to dive by carrying them on their backs and then diving under water; some cliff-nesting birds like guillemots and razorbills are said to coax the young from the nesting ledges for the first flight to the sea below.

An interesting point, not much studied, relates to the question of how birds first learn to be afraid. With nidicolous birds, there appears to be a definite period after the hatch before the chicks become fear-conscious, and then quite suddenly, fear becomes a part of their consciousness. Thus if a nest of young yellow wagtails is visited regularly each day after the hatch, it will be found that for the



first few days, the young will rise in the nest with open beaks and the usual food-clamour cries, if the observer flutters his fingers above the nest and makes an appropriate clicking noise with his tongue. Then, quite suddenly, on the sixth to seventh day after the hatch, the reaction of the young changes. They no longer respond to the artificial stimulus, but cower in the nest. Fear has suddenly entered into their conscious world. How they learnt it, we do not at present know. With young tree-sparrows, fear is acquired quite suddenly at seven and a half to eight days after the hatch; with the young cuckoo, the period is sixteen days.

The position of the nidifugous birds is very different from that of the nidicolous birds just described, for the young are born with complete down-patterns, have sight, and can run as soon as they are dry after the hatch. Hence, with the waders and gamebirds, we find that fear is an instinctive acquirement which the young possess from birth. Within an hour the chicks will respond to calls from the adult birds, and immediately crouch motionless on the ground, often with necks outstretched and eyes closed.

We have dealt so far with the processes of learning in young birds, and there remains the consideration of learning in adult birds. This brings us to a consideration of how far a bird can bring any intelligent process to bear upon the solution of a specific problem. Animals can solve a given problem in two ways; namely, by 'trial and error' methods in which a lot of different ways are tried, until the correct one is finally hit upon; or a solution is obtained by methods showing a true appreciation of the situation, so that the desired end is attained by an intelligent grasping of ways and means. This latter is known as 'insight-learning' (Köhler), and at first we should probably assume that learning of the latter type is rare in birds, since their actions are not in general dictated by intelligent processes. But there is no doubt that some birds do on occasion show glimpses of insight-learning. Most people who hang out nuts for tits will have seen how the great tits will pull up the string, loop by loop, *and secure the slack by standing on it*. This latter ability shows definite progress towards an intelligent solution of a problem. Not all birds learn it, for while great tits, and (in cages with food-trolleys), goldfinches and siskins learn the trick, the robin, supposedly one of our most 'intelligent' birds, never solves the problem of obtaining food at the end of a string, and neither do chaffinches or starlings.

The account given above is merely an indication of the main aspects of our present knowledge of how birds learn. There is room for much research and for the application of scientific methods to the study of the innumerable problems which arise during the course of a bird's life and the means by which the bird solves those problems. Anecdote and anthropomorphic interpretations need to be replaced by scientific methods and a clear appreciation of the limited intelligence of the mind of a bird.

## BOOK REVIEW

**The National Trust**, edited by James Lees-Milne, introduced by G. H. Trevelyan, O.M., pp. 132, with over 100 illustrations; Batsford, 12/6. This delightful book appears at an opportune moment. So much of our heritage of natural beauty, and so many of our historical monuments, have suffered by the ravages of war that never was the need so urgent to ensure the preservation of all that remains. Both illustrations and text give a comprehensive survey of the scope of the work undertaken by the Trust. To peruse these pages is in itself a liberal education. Of particular interest to nature lovers is the section dealing with our Nature Reserves. All too few people realise that our flora and fauna have their place within the care of the National Trust. It is not merely a question of the preservation of the relics of a dead past, but also the preservation of a living present in the trees, flowers, birds and creatures that people our countryside. One would like to see this book placed in every school library, as an aid in the education of the rising generation. If they could be brought up to regard themselves as heirs to the rich legacy enfolded in this all too brief survey, they would be all the better citizens, and the National Trust would have behind it a protecting body that would banish the need for legal covenants, and effectively stay the hand of the despoiler.



# THE YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) COMMITTEE FOR ORNITHOLOGY

*Chairman :* R. M. Garnett.

*Recorders :*

North Riding : R. M. Garnett, Thornton-le-Dale.

East Riding : G. H. Ainsworth and J. Lord, M.Sc., 144 Gillshill Road, Hull.

West Riding : R. Chislett, M.B.O.U., Brookside, Masham, Ripon.

York District : E. W. Taylor, 11 The Avenue, York.

*Hon. Secretary and Editor of Records :*

Ralph Chislett.

## Report for 1945.

WHEN a member of the Y.N.U. suggested to me recently that this report is becoming too formally stereotyped, I remembered the many years in which each of several excellent recorders prepared a separate report, published consecutively, with no attempt at uniformity in standard of any kind—order, material, verification, style—nor with any attempt to compare, or correlate, or reference records, so that anyone seeking information about Yorkshire birds had to look in several places in any and every year, and when there was no separate existence from the pages of *The Naturalist*. Regional ornithological reports of any importance all gain value by adherence to a standard form and order such as we now use ; and where a larger report is issued, by inclusion of articles on individual species, areas or aspects, with an illustration or two, the regional society concerned rarely publishes a journal. This report is still a part of *The Naturalist*, in which, during the year, other matter ornithological has been published.

The most interesting development of 1945 has been the establishment of a ringing station at Spurn, which had been under consideration before 1939. R. M. Garnett, G. H. Ainsworth and C. E. A. Burnham, who with J. Lord and myself form the Ringing Sub-Committee, met there in September for the selection of a suitable site. With the war over the War Department readily gave consent and has, indeed, been most helpful in many ways, amongst other things loaning us the use of a hut pending release of the Warren Cottage. The Ringing Sub-Committee particularly desire to record their cordial thanks to Mr. Iveson, Clerk of Works at Spurn, to the Garrison Engineer, Mr. D. J. Batchelor ; and to the D.S.R.E., Hull. We also wish to thank Capt. Palmer, R.A., Sergeant Johnson, and Gunners Morrison, Stacey, Goodfellow and Wooderston for the assistance they have given so readily to G. H. Ainsworth. The long experience of R. M. Garnett of ringing-traps has been most valuable. Without the expert technical skill and enthusiasm of G. H. Ainsworth, and the considerable time he has generously given, the plan could not have been carried out.

November 17th was a late date on which to begin (with a Blackbird) ; most of the migrant passerines had passed ; but Blackbirds, Greenfinches, Robin and Hedge Sparrow had been caught, ringed and released before the year end. At a ringing station, species that suffer from the contempt caused by over-familiarity come into their own again. We shall be as interested to know whence and whither the common visitors to Spurn come and go, as we shall be concerning rarer species. As Hon. Secretary of the Ringing Sub-Committee, G. H. Ainsworth will be glad to arrange for members to help at Spurn as they can spare time, so that the trap can be kept working as continuously as possible, especially during the time of the spring and autumn movements. We are in touch with the ornithologists working the ringing-traps on the Isle of May and on Fair Isle, who have already had the loan for study of the Spurn Notebook started in 1937 by R. M. Garnett, and to which those who have since given time to watching birds at Spurn have contributed in the form of field notes, as well as on the formal chart. Closer collaboration and interchange of experiences will follow.

In early September, whilst G. H. Ainsworth and others were watching at Hornsea Mere, at Spurn, and on the Humber-side near Ferriby, your Secretary spent some days at Trent-mouth, where that river enters the Humber. In the same week in 1944 there was considerable movement westward up the Humber, past Ferriby, of Swallows and Martins ; and it was desired if possible to trace

such movements from the Humber up the Trent towards the sewage works near Nottingham, where such remarkable records are being habitually made during the late summer and early autumn; and where Nottinghamshire naturalists were also on the watch during the same period. Pre-arranged time is generally of the essence of human contracts; but bird movements are uncertain from year to year; and there was no stream of migrants up the Humber at that time in 1945 that could be connected with the Trent Valley. Such passage movements as could be seen up the Trent are mentioned under the heads of the species concerned in the 'classified notes.' Sufficient of the country, and of the birds feeding on the large areas of mud flats left exposed by the ebbing tides was seen to make the experiment worth repeating.

Much of our Chairman's time in spring was taken up with special assistance to the Forestry Commission in connection with their provision of nesting boxes in Dalby, Wykeham and Cropton Forests. From his admirable report we learn that 36 boxes, made locally by the forestry employees, were fixed during March, 12 in each forest, suitable for Tits, Pied Flycatcher, etc. The sites chosen were chiefly along the becks on the fringes of the plantations of conifers, where oak, ash and alder gave a more open canopy, and with water close at hand. The time of the erection gave opportunities for migrant species to compete with resident Tits in areas where natural holes are scarce. As more boxes become available it may be advantageous to keep a proportion in hand until March for the late arrivals. To avoid disturbance, the boxes were not built for inspection. Two-thirds of them were occupied, most frequently by Great, Blue and Coal Tits, although in one forest Pied Flycatchers raised broods in five boxes out of twelve. Curiously, not a box was occupied by Redstarts, although the species readily takes to boxes elsewhere. Grey Squirrels opened one box, and subsequently the feet of young birds were found in the remains of the nest of grass. Except in the case of a pair of Great Tits which brought green caterpillars, possibly of sawfly, frequently from a larch plantation, it was impossible to say if food was collected from the deciduous trees, or from the adjacent conifers. Mr. Garnett makes the interesting suggestion that a plan tried successfully in America of providing an artificial nestling at the entrance of a sample occupied box, with a bottle of spirit below, would make a sample record of food available; the victim's brood being provided for during the experiment.

From these valuable activities the Chairman allowed his general work to suffer very little; and he has again been a great source of strength with material for this report. Without his generous help, and that of the Recorders for the East Riding and the York District, the compilation, assimilation, and co-ordination of the year's records would have been much more arduous; and the result much less complete.

After a severe January, during or prior to which Plovers mostly left the north of England, February was mild and March dry; and spring came early, with early returns of some of the migrants. Snow fell again at the end of April, and there were frosts in early May. June and July produced summer weather, and after a cold and showery period in August, autumn was warm and dry until the weather broke on October 20th. Mild weather continued to the end of the year, except for a cold spell in early December.

To the many who have helped to make this report a success the Recorders offer their grateful acknowledgments. Initials as used in the report can be traced to their owner's names on the following list. Items taken from the excellent chart of birds seen at the Gorple Reservoirs, prepared by E. W. Watson from the joint records of S. Cockcroft, V. S. Crapnell, J. Crossley, G. R. Edwards, E. J. Hosking, D. Mills, R. Speak, S. Sunderland and E. W. Watson have been designated as from the 'G. Chart.'

The numbers preceding the names of species in the 'classified notes' are those employed in Witherby's *Handbook of British Birds*.

Contributors are: Miss M. W. Ackley, J. R. Artley, G. H. Ainsworth, Ampleforth College Natural History Society (A.C. Notes), F. K. Beaumont, G. Beaumont, J. E. Beckerlegge, W. Bennett, P. Baldwin, W. G. Bramley, Bradford Naturalists, J. P. Biggin, H. O. Bunce, C. E. A. Burnham, C. B. Burstall, L. Carr, J. A. Chadwick, the late W. J. Clarke, C. A. Cheetham, R. Chislett, S. Cockcroft, G. Cockshott, Miss E. Crackles, V. S. Crapnell, R. W. Crosland, J. Cudworth, K. Dawson, F. Dean, H. Dibb, F. H. Edmondson, G. R. Edwards,

G. A. Ewbank, W. F. Fearnley, W. J. Forrest, H. Foster, F. M. Firth, T. M. Fowler, R. M. Garnett, A. Gordon, G. A. Garton, W. Greaves, R. Green, L. A. Greensmith, L. Greenwood, W. E. Heathcote, R. Hewson, O. C. Hill, E. Holmes, J. A. Horne, G. Howard, G. E. Hyde, F. Jefferson, P. S. Kenyon, K. S. Kilner, O. J. Lambert, Miss E. P. Leach, C. Lilleyman, B. Linney, A. C. Laughton, the late M. Longbottom, S. Longbottom, J. Lord, Malet Lambert High School Naturalists, C. W. Mason, W. S. Medlicott, I. Morley, F. C. Niven, F. Newton, Newland High School Nature Students, C. Oakes, A. G. Parsons, K. G. Payne, C. F. Procter, R. Rawling, C. Reynolds, Miss J. Ridgway, T. N. Roberts, E. Rutter, H. Spencer, D. E. Swithenbank, E. W. Taylor, A. Thompson, C. F. Tomlinson, R. Tottie, T. R. Tyson, D. C. Urquhart, J. P. Utley, D. Utley, D. Wade, E. A. Wallis, K. Wainwright, J. R. Waites, E. W. Watson, D. Walker, C. H. Wells, A. Whitaker, H. Williamson, A. Wilson, A. Wood, H. F. Woods, and the Gorples party.

### CLASSIFIED NOTES

1. RAVEN.—A bird was seen in Dalby Warren (N.E.) on July 6th (R.M.G., W.S.M.). In Upper Swaledale a bird rose from a nest on a ledge of a rock face on March 14th; on July 5th an adult and two fully-grown young were seen in the same area (J.P.U.).

2. HOODED CROW.—A pair began nest-building in late April near Stocks Reservoir. Mr. J. Kean, the reservoir keeper, said one was shot and the other left the area soon afterwards (C.O.). A bird was seen near Gilling on October 24th (A.C. Notes); and two at Saltwick Nab on October 29th (R.M.G.). At Spurn there were small numbers from November 4th (H.O.B.); twenty there on November 17th, and on several dates in December the species was numerous (G.H.A., J.R.W. and J.L.).

3. CARRION CROW.—Near Goathland 17 flew in pairs from the south-east on March 13th (W.S.M.). Small parties flew south along the Spurn Peninsula all day on April 15th; towards the end of the peninsula they turned east, seaward (G.H.A.). Near Methley (W.R.), crows watched Lapwings and Redshanks back to their nests which they raided, no young being reared (P.B.). A bird shot at Gargrave recently was completely white, it had been noted for about two years (R.T.).

4. ROOK.—For the rookery count, Malet Lambert High School Naturalists counted over 4,000 nests between the River Hull and the coast (G.H.A.). In an area round Bolton Percy of some 65 square miles, W. G. Bramley counted 3,001 nests. The census of breeding pairs in an area of 670 square miles of eastern part of North Riding revealed 10,000 nests in 205 rookeries (C.E.A.B.). In the Scarborough area the Ministry of Agriculture is stated to be responsible for close shooting of adult rooks at the time the young were hatched (W.J.C.).

5. JACKDAW.—On May 5th at Buttercrambe, a bird stood on the prostrate body of a horse, pulling out the remains of its winter coat and carrying the horse-hair away. Several pairs were building nests in spruce tops at Kirkdale on April 17th (R.M.G., C.E.A.B.).

7. MAGPIE.—In Wharfedale, a bird swooped at and drove a Golden Plover away from its eggs. The keeper, W. Fleisher, intervened; but later found the eggs had been raided (W.F.F.). The roost mentioned in our report for 1942 continued in use in 1945 by similar numbers of birds (J.P.U.). Observers in most districts consider the species now too numerous.

10-11. JAY.—Five birds flew at 400 feet over open moor, south-westerly near Goathland on October 5th; possibly immigrants (W.S.M.).

14. STARLING.—A bird ringed as adult by Bootham School on November 5th, 1944, was recovered at Crewe in February, 1945. Information of a large roost between Thirsk and Masham came from Mr. G. Beaumont, *via* Mr. P. S. Kenyon. On November 26th, flock after flock, some containing up to 10,000 birds, settled in the area of overgrown thorns; and by dusk the roost must have contained near to 100,000 starlings. Used prior to the war, the roost was deserted owing probably to activity at an adjacent aerodrome. Occupation was resumed in September, 1945 (R.C.). The decline in numbers of Starlings in the Sheffield area noted for two years past is still marked (A.W.). Many Starlings were about the lighthouse at Spurn on the night of October 28th (G.H.A.).

17. GOLDEN ORIOLE.—I listened for some minutes to a Golden Oriole singing in perfect song, close to my house at Goathland, about 30-40 yards from



me, in thick foliage of young birch, but never got a view of him. He was about 30 feet up' (W.S.M., who is very well acquainted with the song). On June 6th Miss Crosland watched a hen bird for some minutes near Hutton-le-Hole from within a few feet, as it fed on the ground on some kind of insect. On June 19th a cock Golden Oriole got up from amongst bracken and flew into a tree, less than a quarter of a mile from where the hen had been seen on June 6th (R.W.C.).

18. **HAWFINCH.**—A bird was picked up dead in a small wood near Ilkley on June 11th, and one seen in Wharfedale on December 28th by Dr. Crosbie (W.F.F.). Single birds were seen near Scarborough on March 21st (W.J.C.); Gilling on June 8th (A.C. Notes); Goathland, feeding on haws on August 27th (E.C.); and Sleights on February 27th (W.S.M.). In the East Riding a pair was seen at Brantingham on April 10th (L.A.G.); and a single bird fed in an oak at Risby (E.C. and C.R.), where a bird was seen in 1943. The species was present on its old ground near Knaresborough (R.H.); and was seen feeding young near Chapelton on June 2nd, in which district it was seen at other times (W.E.H.).

20. **GOLDFINCH.**—C. Lilleyman saw a flock of 100 birds near Rotherham on May 14th, and subsequently saw a pair at the same place on June 7th. For a week from September 21st, about 20 fed on thistles near Ilkley (H. G. Williamson per W.F.). About a dozen were about Melton brick ponds on September 29th (E.C.). At Spurn birds were noted on November 4th (H.O.B.) and on October 4th, November 17th and December 2nd (G.H.A., J.L., R.M.G., J.R.W.). Reports of nests found come from a number of districts in all three Ridings, and the species is agreed to be still increasing.

21. **SISKIN.**—About 20 fed on alder cones in Kirkdale on February 2nd (C.E.A.B.); and parties are recorded in the autumn at Spurn—seven on November 3rd (G.H.A.), near Stapeley on November 7th (F.J.), Thornton Dale, November 4th, 6th and 8th (R.M.G.), and at Masham on December 14th (R.C.). R. Hewson noted the arrival of 40-50 in the riverside bushes near Knaresborough in the third week of December; and a flock was seen by the river at Ilkley on December 26th (W.F.F.).

23. **MEALY REDPOLL.**—Several birds among Lesser Redpoll parties in Thornton Dale on November 4th, 6th and 8th showed the white rumps and wingbars of this sub-species (R.M.G.). Near Haxby, flocks were present from October (F.J.). Among large numbers of Lesser Redpolls seen at Spurn on November 3rd, one flock of about 50, watched for 15 minutes at ten yards' distance, were of this sub-species (G.H.A.). There were two at Spurn on November 11th (J.L.). About 40 occurred near Goathland on November 17th (W.S.M.).

25. **LESSER REDPOLL.**—W. S. Medlicott records feeding on insides of dandelion buds on May 12th at Goathland, which Greenfinches also did on May 15th.

29. **BRITISH TWITE.**—Two pairs were noted in Upper Swaledale on May 24th (J.P.U.). Six nests were found in the Halifax area (E.W.W.).

33. **BRITISH BULLFINCH.**—Very common now in the Sheffield and Barnsley areas (A.W.); and agreed to have increased in numbers generally in the county.

40-41. **CHAFFINCH.**—A nest near Stockbridge had two eggs on the early date of April 5th (A.W.). The crossbar of a telephone pole was used to support an April nest in Thornton Dale—it was unsuccessful (R.M.G.). Numbers of Chaffinches at Spurn on October 14th may have been, or have included, the continental sub-species; birds were numerous at Spurn again on October 21st (G.H.A. and J.L.).

42. **BRAMBLING.**—A heavy crop of beech-mast kept Bramblings numerous in Thornton Dale until February, 1945, where the species was last seen on April 8th (R.M.G.). Had arrived at Nunthorpe (lower Tees) by October 19th, in which month small flocks were noted at Wiggington, near York (F.J.). At Spurn a few were noted with Chaffinches on September 29th (G.H.A., J.L.). Two had reached the Sheffield area by October 14th (G. Cockshott).

43. **CORN-BUNTING.**—This species has disappeared completely from one area in South Yorkshire, and birds have become very few in another, in both of which it was colonised until recently. Is it the result of better cultivation? (A.W.). There were small parties at Spurn on October 4th, 21st, and on November 11th (G.H.A., J.L.).

44. **YELLOW BUNTING.**—There were large flocks around Bridlington on December 30th (G.H.A.).



50. ORTOLAN BUNTING.—An exhausted bird picked up at Spurn on September 15th proved to be a bird of the year of this species (G.H.A. and J.L.).
59. SNOW-BUNTING.—A bird occurred at Gorple on January 7th and February 22nd (G. Chart). A male was picked up dead at Goathland on March 11th (W.S.M.). Single birds were seen at Hayburn Wyke on October 28th (K.G.P.), at Spurn on November 18th (G.H.A., R.M.G., J.L.), and on December 27th (G.H.A.); and two near Cloughton, October 28th (K.G.P.).
62. TREE-SPARROW.—A pair at Leathley on March 30th were seen to drive Great Tits from a hole (T.R.T.).
69. WOOD-LARK.—See *Naturalist*, 1946, p. 17, for record of breeding discovered by E. M. Rutter in 1945.
70. SKY-LARK.—The absence of Sky-larks from the Buckden area of Wharfedale was again noted on March 1st (J.E.B.); and during a week at Whitsuntide (M.L.). Sky-larks can usually be seen at Spurn; but large flocks were noted on October 14th (H.O.B.).
75. TREE-PIBIT.—First seen on April 12th in the Sheffield area (A.W.); on April 15th near Barnsley (T.M.F.), and Bradford (S.L.), and at Goathland (W.S.M.). Noted on migration at Spurn on September 8th (E.W.W.), and on the 15th (G.H.A., J.L.).
76. MEADOW-PIBIT.—Passage birds were numerous at Spurn on September 15th; and fairly numerous on September 29th, October 4th and 14th (J.L., G.H.A.).
81. ROCK-PIBIT.—One was seen at Spurn on April 15th (G.H.A. and D.C.U.), and small numbers were there from October (H.O.B.), and north of Scarborough on November 18th (K.G.P.).
- [84. BLUE-HEADED WAGTAIL.—A bird seen by C. Oakes, A. Welch and K. G. Spencer at Sawley, near the Lancashire border on April 29th, had a white eyestripe and pale slate crown and was thought to be a female of this species.]
88. YELLOW WAGTAIL.—E.W.T. sends a very early record from Tilmire on April 2nd; and by April 15th the species was on its breeding ground near York. April 13th at Bingley (S.L.), and near Barnsley (T.M.F.), are still early occurrences. Birds were still passing along the coast on April 28th, Scarborough (D.E.S.); and at Spurn on May 3rd (G.H.A.). At Swillington Ing there was a party of eight on April 28th (K.D.). The autumn passage was first noted at Spurn on July 14th; many on August 15th (H.O.B.), and up to September 29th (G.H.A. and J.L.). About 40 were gathered together at Swillington Ing on August 19th (R.C., K.D.). In the Sheffield area the species was last seen on September 18th (A.W.).
89. GREY WAGTAIL.—Several former regular breeding-sites near Sheffield are now abandoned, but birds on waste ground in the city were noted several times during winter, at feeding places probably discovered as water courses were followed (A.W.). Odd birds were noted near Ilkley on January 7th and December 9th (W.F.F.), and near Harehills, Leeds, on February 11th (J.R.). Three were on the shore at Whitby on September 10th (C.E.A.B.). Arrived at East Park Lake, Hull, early in October and was seen there all the month (G.H.A.).
90. PIED WAGTAIL.—This is an unusual species to tap on a window at its own reflection, but at Partridge Hill, Goathland, a hen began doing so on April 22nd and continued for much of each day, for several months. The cock looked on. How she found time to have the two broods reared was a mystery (W.S.M.).
91. WHITE WAGTAIL.—Noted by Scarborough Mere on April 20th (W.J.C.), and at the Sewage Farm, Bingley, on April 26th, May 13th and September 25th (S.L.).
96. NUTHATCH.—Much more widely spread than was thought a few years ago. Recorded in Harewood Park (W.B. and W.F.F.), and well established in lower Nidderdale and lower Wensleydale up to Leyburn. Fairly numerous about Masham (R.C.). Noted in lower Teesdale (G.A.E.), and near Doncaster (G.E.H.). Recorded from Sleights and Goathland (W.S.M.); Thornton Dale (R.M.G.), several pairs in Kirkdale (C.E.A.B.), and well established in the dales north of Helmsley (A.G.). Three birds seen near Bashall Eaves on September 5th appear to have been in a new locality (W. Beaton per C.O.). During early stages of nesting in Kirkdale, bits of bark were carried into the hole for five minutes only in an hour; and mud had not been applied to the hole on April 17th. Both birds were quiet whilst building proceeded (C.E.A.B.).

98. BRITISH GREAT TIT.—A pair reared two broods near Goathland in nesting-boxes five yards apart, the second brood still being fed in the box on July 28th (W.S.M.).

107. BRITISH MARSH-TIT.—On July 28th, a pair were eating flower petals of betony near Goathland (W.S.M.).

108. BRITISH WILLOW-TIT.—Since publication of notes on this species in Yorkshire (see *Naturalist*, October, 1945), E. M. Rutter has recorded a pair that bred on Crayke Hill in 1941, some 350 feet above the eastern side of the Plain of York, 40-50 feet up in a spindly ash. The altitude of this nesting hole was much higher than any I have yet seen; and the site so high on a hill is also outside my experience. Regarding the statement that I should not expect to find the bird breeding on the Wolds, W. B. Alexander writes that he finds the species on chalk in Oxfordshire (R.C.). R.M.G. noted the species at Dalby Camp on October 8th—the first in Thornton Dale since 1940. Two were noted at Bishop Wood, Selby, on October 3rd (J.E.B.). A bird was noted at Templenewsam on March 18th (H.F., I.M., V.S.C.); and at South Cave at very close quarters on March 29th (E.C.).

114. GREAT GREY SHRIKE.—A bird at Goathland from February 20th to March 14th, 1945, fed chiefly on beetles (*Ceratophytus typhoeus*); and killed and impaled a Blue-tit (W.S.M. in *British Birds*, Vol. 38, pp. 253-4).

120. WAXWING.—A bird was seen at Easington on January 31st (P. R. Welton). In the North Riding birds occurred near Scarborough, two on January 26th (W.J.C.); seven at Nunthorpe on November 29th; and some at Great Ayton also in November (O.C.H.); seven at Pickering on rose-hips on December 29th (R.M.G.); 40 to 50 at Throxenby Mere, Scarborough, on December 20th, and an odd bird in Peasholm Park on December 21st, in both cases feeding on haws (G.A.G.).

121. SPOTTED FLYCATCHER.—First reported on May 9th, Risby (E.C. and C.R.) and near Sheffield, where it was last seen on September 9th (A.W.). A bird arrived at Methley, near Leeds, on May 14th, reared a brood, and all disappeared on July 5th (P.B.).

123. PIED FLYCATCHER.—Seen in Kirkdale on April 17th (C.E.A.B.) and near Otley on April 29th; status as usual in Bolton Woods (C.F.T. and A.T.); bred near Muker (J.P.U.). Bred in usual places in Scarborough area (W.J.C.). Five nest boxes occupied in Cropton Forest (R.M.G.). Plentiful in Goathland-Egton area. Seen on the coast in autumn near Whitby (C.E.A.B.); and at Spurn on September 9th (H.O.B.), and on the 15th (J.L. and G.H.A.). On May 9th, W.S.M. watched a cock singing and moving about a small area for an hour. Suddenly a hen appeared close to him and he became very excited, spreading his tail and crouching flat on branches. Over and over again they went in and out of the nesting box at the mouth of which he had been many times in the past two or three days. Just before she appeared he had entered it once. It appeared to be the first meeting of the pair. Later in the day the hen was building.

126-127. GOLDCREST.—Nested at Weedley Springs (L.A.G.). A small party remained at Old Bramhope (Leeds) for 14 days from October 14th (T.R.T.). Many birds at Spurn on October 21st and 27th, and on November 4th; one there on November 17th, and two on the 18th. (H.O.B., R.M.G., G.H.A., J.L.).

129. CHIFFCHAFF.—Noted at Wiggington on March 30th (F.J.), near Sheffield on April 1st (A.W.), and at Hackness and Kirby Misperton (W.J.C.) and at Buttercrambe (E.M.R.) on April 2nd. A pair remained all summer near Todmorden (J. Bentley per W.G.). An unusual breeder in lower Wharfedale, it was heard at Harewood on April 17th; and several times near Ilkley in May (W.F.F.); and was singing at Pool on September 6th and Old Bramhope on September 10th (T.R.T.). Birds occurred at Swillington on September 3rd (T.R.T. and J.E.B.), at New Earswick on the 10th and at Monkbridge on the 14th (F.J.). At Spurn two occurred on September 15th, one on October 4th; and two were definitely identified near the cottage on November 3rd (J.L. and G.H.A.).

132. WILLOW-WARBLER.—The earliest record was in my garden at Rotherham on April 7th, and on the 8th it was at Roche Abbey (R.C.), Chapeltown (W.E.H.) and near Barnsley (T.M.F.); and near Bradford on the 9th (S.L.). On May 2nd a nest near Stocksbridge held six half-incubated eggs. On May 22nd a nest held six pure white eggs (A.W.).

135. WOOD-WARBLER.—Rather curiously the earliest records come from the north-east—Thornton Dale (D. Green) and Kirkdale (C.E.A.B.), both on

April 16th. Was noted at Boynton on September 7th (H.F.W.) ; and at Spurn, two on September 15th (G.H.A. and J.L.).

145. GRASSHOPPER-WARBLER.—Heard near Sheffield on April 18th (A.W.). There are no breeding records ; but cocks were heard near Doncaster (G.E.H.), Grassington (J.E.B.), York (T.R.T. and K.G.P.), near Scarborough (K.G.P.), and in lower Teesdale (G.A.E.).

149. REED-WARBLER.—Had arrived at Scarborough Mere by April 19th and several pairs bred (W.J.C.). A bird was seen at Castle Howard (site of an old colony) on July 5th (A.C. Notes). The colony at Kelsea Hill was up to normal ; young were seen on June 23rd (G.H.A. and C.F.P.). On July 3rd near Goole, I found a new colony for the West Riding of about a dozen pairs ; young were being fed (R.C.).

153. SEDGE-WARBLER.—The earliest report comes from Hornsea Mere on April 21st (E.C.).

161. GARDEN-WARBLER.—First heard in 1945 in the Sheffield area on April 19th (A.W.) ; and near Scarborough on April 21st (D.E.S.).

162. BLACKCAP.—First heard on April 17th near Scarborough (W.J.C.), and near Sheffield on April 19th (A.W.). A cock bird occurred at Spurn on November 3rd (G.H.A.).

163. WHITETHROAT.—There were some early arrivals this year ; April 17th at Scarborough (W.J.C.), and Wakefield (A.C.L.), April 18th near Nunnington (Vale of Pickering) (C.E.A.B.) ; and April 19th near Sheffield (A.W.), and at Towthorpe, near York (F.J.), and Pickering (R.M.G.). All these were earlier than S. Longbottom's at Bingley of April 21st, which was his earliest date in his experience. Several occurred at Spurn on September 5th (G.H.A.).

164. LESSER WHITETHROAT.—Very scarce near Sheffield ; the only bird heard sang on April 25th (A.W.). Farther east the species were still scarce but I heard two singing cocks in May (R.C.). At Spurn a bird was noted on September 15th (G.H.A. and J.L.).

173. FIELDFARE.—The remains of a bird ringed as a nestling in Bergen, Norway, on June 12th, 1944, was found at Picton, near Yarm, in February, 1945 (O.C.H.). On January 1st, 1945, in thick mist, several Fieldfares came in from the sea near Flamborough, flying due west, low over the waves (F.M.F.). On March 18th in Swaledale a flock of 75 birds were attempting a low burbling song (J.P.U.). Two birds were seen near Whitby (Hutton Mulgrave) on May 9th (C.E.A.B.).

Flocks of Fieldfares have been unusually numerous and large in Yorkshire this autumn and winter. As early as October 1st, P. Baldwin reports east to west intermittent flight all day of small parties near Methley (lower Aire) ; noted at Gorple on October 6th (E.W.W.) ; and at Old Bramhope the species was noted on the 7th (T.R.T.), on which date a bird was also seen at Spurn (H.O.B.) ; at Austwick birds were noted on October 9th (C.A.C.). But large-scale, mass immigration did not begin until towards the end of the month. Large flocks were at Ampleforth on October 24th (A.C. Notes). At Masham on October 28th numbers flew over after dark, and the fields and trees held large numbers on the following morning (R.C.). Flocks at Spurn on November 3rd numbered more than a thousand birds and many were there until the year end (G.H.A.) ; at Stone Creek, up the Humber, on November 4th a flock was estimated at 500 birds. Many thousands arrived near Goathland on November 4th and stayed until the 18th, numbers decreasing thence until the year end. R. Hewson describes extraordinary large movements in lower Nidderdale in late November and early December. At all times in November and December numbers could be seen almost anywhere in the northern parts of the Plain of York, and along the slopes of the eastern ends of the western dales (R.C.). E.W.T. records very large flocks near York in the same period. Reports of flocks come from most parts of the county and are too numerous to mention.

175-7. SONG-THRUSH.—In the area between Helmsley and Pickering, and at Hutton-le-Hole, R.W.C. noticed scarcity of this species and connects increased damage by slugs and snails. There is no doubt the bird is much less common than a few years ago. At Spurn there were two on October 21st and November 11th (G.H.A.).

178. REDWING.—The bird was first seen at Spurn, and near Hull, on October 4th (G.H.A. and J.L.). At Austwick C.A.C. noted it on October 9th. Some



passed over Wakefield on the night of October 7th (A.G.P.), at Hebden Bridge on October 11th (E.W.W.), and at Thornton Dale it was duly noted, but very large numbers did not appear until the first week of November (R.M.G.). Birds were at Ampleforth in the last week of October in large numbers (A.C. Notes). Passing very numerous inland all day at Spurn on October 21st, fairly numerous there on November 3rd; on December 27th only two could be seen (G.H.A.). Some reports of numerous Fieldfares bracketed this species with them, but generally it does not seem to have been quite so noticeable.

182. **RING-OUSEL**.—A bird was in Swaledale on March 11th in an area where 16 pairs were located in May (J.P.U.). On March 22nd a Ring-Ousel in Thornton Dale was the only one ever seen by R.M.G. south of the moorland. None reported at Spurn this year (G.H.A.). Two nests held eggs on April 22nd near Gorpel (E.W.W.).

184. **BLACKBIRD**.—Several birds were seen on January 1st, 1945, flying westward low over the sea in mist near Flamborough (F.M.F.). A brood at Thornton Dale were fed in the nest, and when fledged, on wild cherries. Numerous at Spurn on October 21st and November 3rd; a few were there on November 11th (G.H.A. and J.L.). Immigrants were coming in from the sea at Whitby on October 28th and 30th; and there were many on the cliff line (R.M.G.).

186-7. **WHEATEAR**.—The earliest bird reported was in Swaledale on March 14th. The latest date was November 23rd, a female which had frequented allotment gardens near Scarborough gas works (T.N.R.). A very tame Greenlander occurred near Goathland on May 14th (W.S.M.). Two birds thought to be of the Greenland race at Spurn on September 9th were closely compared with typical birds and were larger, taller, more upright and had deeper buff underparts (H.O.B. and E.W.W.).

197. **WHINCHAT**.—Numerous Whinchats were at Spurn on September 15th (G.H.A.), and several on September 23rd (H.O.B.).

198. **BRITISH STONECHAT**.—Miss Ackerley saw a bird near Long Preston on April 24th. The species nested on the moor edge near Ilkley (W.F.F.).

201. **REDSTART**.—First seen on April 13th near Shipley (J.A.H.). Autumn passage at Spurn was normal, birds being seen September 6th to 9th, and on the 15th (R.M.G., C.E.A.B., G.H.A., J.L.).

202. **BLACK REDSTART**.—One at Spurn on October 29th (W.F.F.).

203. **NIGHTINGALE**.—A male sang in May, and the scolding note was heard in June in the Thorne-Hatfield area (G.E.H.).

207-8. **ROBIN**.—In severe weather in January there were several on rocks north of Scarborough (K.G.P.). Five at Spurn on November 5th, and fairly numerous on the 11th (J.L.).

210-11. **HEDGE-SPARROW**.—Fairly numerous at Spurn on dates in October and November (G.H.A., J.L.). At Sheffield a pair began to build on April 11th, finished on the 16th, had four eggs on the 20th, of which the incubation and fledgling periods lasted 23 days (three only hatched). By June 5th a second nest also held four eggs, all hatched, one died in a day or two and was left in the nest, and another was abandoned when two were ready to leave. The recorder, L. Carr, considers one of the pair was old or weak. W. E. Heathcote records a bird carrying nesting material on March 19th near Sheffield.

213. **WREN**.—After the Methley resident pair had partially laid, on April 23rd, P. Baldwin noticed an influx of further birds, followed by a second period of song; and on June 24th, four nests held eggs all of which hatched and flew. Is this a sidelight on the powers of recovery of the species from disasters in such winters as that of early 1940? Fairly numerous at Spurn on October 21st (G.H.A.).

218. **BRITISH DIPPER**.—Whilst one of a pair on April 5th, near Goathland, remained bobbing on a stone, the mate dived, swam, surface dived, etc., without appearing to obtain food; and was out of the water for very short periods only. (See Kirkman's *British Bird Book*, Vol. 1, p. 307, concerning display.) (E.C.).

220. **SWALLOW**.—First seen over Hull on March 18th (N.H.S.N.S.), and over Farnley Lake on April 7th (T.R.T.). At Spurn on April 15th a bird flew in from the Humber and turned south (G.H.A. and J.L.). A bird was seen at Spurn on November 4th (H.O.B.). Very scarce in the Scarborough area (W.J.C.); and scarcity noticed round Hutton-le-Hole (R.W.C.). Three people independently reported seeing two albino Swallows in the Dewsbury area in July (J.R.).

222. **HOUSE-MARTIN**.—Recorded over Farnley Lake on April 7th (T.R.T.). Over Spurn two moved south on April 15th—they may have come down the Humber



(G.H.A.). A congregation at Swillington Ing on April 28th numbered over 200 (K.D.); and about this time the main body seem to have arrived. Birds were moving south from Spurn on September 15th (G.H.A.). At Methley local birds were feeding young up to late September; but over the adjacent waters birds began to congregate on August 6th, increasing daily until there were several thousands before all left on August 19th (P.B.). Last recorded over Hull on October 11th (G.H.A.).

223. SAND-MARTIN.—The earliest record is from the sewage farm near Bingley where there were 40 birds on April 11th (S.L.); other early dates are April 14th near Scarborough (W.J.C.); and April 17th near Ilkley (W.F.F.). On April 23rd holes were being excavated near Methley (P.B.). Nesting holes near Filey had many young at entrances on August 12th (E.W.T.). Swillington Ing had large numbers hawking on August 5th (E.W.W.), and on September 3rd; by the 8th numbers approached 2,000, on the 9th only about 200 were left (K.D.). At Spurn several passed south on July 22nd (H.O.B.); and many on September 15th; one bird passed on November 3rd (G.H.A.). Last noted inland on September 24th near Boston Spa (J.E.B.).

225. SWIFT.—Miss E. Crackles describes Swifts as numerous at Hornsea Mere on April 21st, an extraordinary date. An early date comes from near Sheffield on April 27th (G.C.). At Keighley two returned on May 2nd, in advance of the main party of local residents (M.L.). W.S.M. noted a passage south over Goathland moors on June 1st: 'Why do they always fly south over our moors at this time of the year?' On July 20th Swifts were going south from the same area in numbers (W.S.M.). At Scarborough local birds nesting near to the late W.J.C.'s house left in a body on the afternoon of July 18th. R.M.G. noticed a south-easterly passage across Dalby Warren on July 17th. At Spurn movement south was first noticed on June 16th (G.H.A.). Last seen over Hull on September 23rd (G.H.A.); a very late bird appeared over Whitby on October 24th (A. B. Walker per C.E.A.B.).

227. NIGHTJAR.—A sucked egg was found near Wakefield on June 19th (A.C.L.). A bird 'churred' in short bursts, on the higher note only, during daylight in Staindale on May 18th, D.S.T. 2-30 p.m. and 4-20 p.m. (R.M.G.). Near Doncaster young birds were seen in mid-June (G.E.H.); and near Scarborough, able to fly on August 26th (W.J.C.).

232. HOOPOE.—The general cinnamon colour, and fan-shaped, black-spotted crest of a bird seen near Long Preston on May 23rd left no doubt of the species (M. E. Ackerley). A bird spent the morning of April 27th on the lawn of the Bishop of Hull's residence, Dalton Holme (E.B.B.). A bird was found dead under wires near the coast at Aldbrough during November and brought to C. F. Procter.

237. BRITISH GREAT SPOTTED WOODPECKER.—E. A. Wallis watched a bird take, kill, and eat a fledgling Great Tit from a hole in Raincliffe Wood. On January 24th a bird was observed to sweep snow off branches near Ampleforth (A.C. Notes).

238. BRITISH LESSER SPOTTED WOODPECKER.—Birds were noted near Doncaster (G.E.H.), near Westella, East Riding (L.A.G.), and in Kirkdale (C.E.A.B.). A dead bird was picked up when grass was being cut near York (W. G. B. Davies).

240. CUCKOO.—Some extraordinarily early reports come from the Scarborough area. On February 15th Mr. W. Harland at Scalby, and Dr. S. Robertson at Ayton, each saw a Cuckoo. On March 15th a male came down exhausted in Museum Terrace, Scarborough, which, after resting, flew away (Mr. Morley, of Museum Terrace, per L.C.). At Stainton Dale a bird was seen by Miss M. Lazenby on March 27th, and daily until it began to call on April 21st. One wishes that people would get another ornithologist to confirm such records when they have the bird under observation for weeks. Apart from the foregoing, arrival dates were normal. On Burley Moor two were hatched in a Pipit's nest and remained for a fortnight, after which both were found dead, one outside the nest (Mr. Flesher per W.F.F.). A bird seen on August 23rd at Goathland by two observers called 'cuckoo' twice—an extraordinary date (E.C.). At Wykeham on June 10th a bird flushed from the roadside left five tail-feathers, and a lot of body-feathers behind; the immediate previous history of this bird would have been interesting since the *Handbook* states that a second partial moult in June and July does not include tail-feathers. A Whitethroat was in attendance. Could attempts to enter one of the blackthorn

tangles close by have caused the loss of feathers? (R.C.). Noted at Spurn (bird of year) on September 15th (J.L. and G.H.A.).

249. **LITTLE OWL.**—Now common over most of the county except (a) the Hambleton and Cleveland area, where it has extended its range to the heads of the dales north of Helmsley (A.G.); (b) the upper reaches of the western dales. Breeds far up Airedale-Keighley area (F.H.E., M.L.), near Crosshills (A.T.); and is suspected of having travelled this way to Clapham. In Wharfedale two breeding records come from near Leathley (W.F.F.), and two pairs were noted on May 7th as far up as Hubberholme (D. Walker) (who also saw a dead bird in a keeper's car). Well established north of Masham (R.C.); and in lower Swaledale (J.P.U.). T. M. Fowler flash-photographed a pair and noted beetles as the most frequent food although mice and voles came occasionally. A Yellowhammer lay at the side of a nest near Nunthorpe on April 21st, and a dead field mouse on May 15th, and remains of rat and birds on May 19th (G.A.E. and O.C.H.). Greenfinch feathers were identified in a nest at Ferriby (F.C.N.). Little Owls occurred at Spurn, two on September 22nd (H.O.B.); one on September 29th (G.H.A. and J.L.).

250. **LONG-EARED OWL.**—Whilst much less common in South Yorkshire than formerly (A.W.) and scarce in the East Riding (G.H.A.) records of G. A. Ewbank about Nunthorpe include four old magpie nests containing three eggs each of this species, one from each having been taken by boys. A fifth nest held three eggs and reared young (G.A.E., O.C.H.).

251. **SHORT-EARED OWL.**—A Swaledale nest with two eggs was found on May 24th (J.P.U.). Two pairs nested on Rombald's Moor, near Ilkley (W. Flesher per W.F.F.). Other birds were seen in the breeding season—at Garsdale Head, young bird seen on June 9th (C.A.C.), in Raydale (J.P.U.), near Sheffield (G. C.), in the Hatfield area (G.E.H.), and at Kilnsea on April 15th (G.H.A. and D.C.U.) and on June 2nd (E.C.). Outside the breeding season birds were seen near Trent-mouth on September 10th (R.C.); at Swillington Ing on September 15th (K.D.); four at Kilnsea from July 21st may have resulted from local breeding (H.O.B.). There were at least five on Spurn on November 3rd (G.H.A.), and one on Tilmire (York district) on December 8th (B.L., E.W.T.).

253. **BRITISH TAWNY OWL.**—A fox left hair on a stump through which it gnawed to reach and kill two young in a hole at ground level on May 11th, near Goathland (W.S.M.).

254. **WHITE-BREASTED BARN OWL.**—T. M. Fowler flash-photographed two pairs in the Barnsley district; the first egg of one pair hatched on June 7th, they had three young and one egg on June 14th, and were still there, not fully-fledged, on July 30th—53 days later. At Nunthorpe, young were 'snoring' in a building on October 19th, with both adults in attendance (G.A.E., O.C.H.).

259. **PEREGRINE FALCON.**—It is time the species had its former protected status restored. Odd birds have been seen in March, and on November 29th in the Vale of Pickering (R.M.G.), at Oswaldkirk on December 5th and 14th (A.C. Notes), on Levisham High Moor on December 27th (W.S.M.), at Kilnsea chasing waders on September 11th (E.W.W.); and on October 14th (H.O.B.).

262. **MERLIN.**—Of several nests in the Cleveland area, two pairs reared young, which in one case had left the nest on July 26th (W.S.M.), and in the other were almost ready to fly on June 30th (C.E.A.B.). A pair near Ilkley were robbed (W.F.F.); a family of three young were seen on July 10th in Swaledale (J.P.U.). W.S.M. records on August 4th that the larger feathers of two young cuckoos killed by Merlins in Dalby Forest, tail and primaries, were not pulled out but apparently bitten off 'about half an inch below the lowest featherings.' The species occurred at Spurn on March 31st (H.O.B.), and on several dates in September (G.H.A. and J.L.), and on September 9th at Trent-mouth (R.C.).

263. **KESTREL.**—A bird ringed as young at Hebden Bridge on July 2nd, 1945, by F. Dean, was recovered near Hazelhead on August 13th, 1945. Another ringed on June 23rd, 1944, as young at Flinton, East Yorks., was recovered at Rothwell, Lincs., on February 24th, 1945 (Miss E. P. Leach in *British Birds*). The *Handbook* does not name Great Spotted Woodpecker as occasional food of Kestrel, but Mr. R. Rawling saw the two species fall to the ground below a tree. Disturbed, the hawk flew away, and the Woodpecker returned to the tree trunk where it was attacked by the Kestrel again, and was again rescued (W.F.F.). On July 10th J.P.U. watched young Kestrels hovering at 50, 20, 2 feet then drop,

pick up something and rise again. On the ground the wings remained spread. This happened many times with no old birds in sight. The food, whether beetles or larvae, was uncertain. At Spurn, two came off the Humber and flew due east over the sea on April 15th; several birds appeared on September 29th and October 21st (G.H.A.).

268. **ROUGH-LEGGED BUZZARD**.—A bird was shot at Goldsborough in March and was seen subsequently mounted in a Leeds shop window (W.B.). J. R. Waites describes, with sketches, a bird probably of this species near Hornsea on December 12th, which he watched for an hour (G.H.A.).

269. **COMMON BUZZARD**.—A nest was found in the Swaledale area on May 24th containing young; three young were located on July 1st after they had left the nest (J.P.U.). One of a pair that attempted to nest near Muker was shot (G.H.). C. H. Wells described as apparently a bird of the year, one he saw near Strines, Sheffield area, on December 5th—he noted one there almost exactly a year ago.

271. **MARSH HARRIER**.—Following a report to C. F. Procter from Mr. Childs, the keeper, visits were paid to Hornsea Mere by C.F.P., G.H.A. and J.L. on September 9th, when the bird reported proved to be of this species, dark brown with yellow head. On the 16th, a second, of similar colouring except for a light buff tail, joined it; and the two soared, and occasionally swept low above the reeds. The keeper stated one bird had been present from about August 20th, and the two birds were first seen together on the 14th.

272. **MONTAGU'S HARRIER**.—C.E.A.B. located a nest on July 7th from which three of the four young had left on July 22nd, one being still there. Three young were reared in a nest in another area (A.C. Notes). Two other pairs were located without proof of breeding, failure of an attempt to do so being suspected in one case. The establishment of the species in North Yorkshire is further evidenced by records of single birds seen in several districts, including Swillington Ing in July. Female birds probably of this species were seen near Spurn on May 13th (H.O.B.), and on September 22nd (E.C.).

273. **HEN HARRIER**.—A male occurred in the Vale of Pickering on January 4th. A female on April 1st was assumed to be of this species from the date (R.M.G.). H. Ward reported a bird at Goathland on February 23rd (W.S.M.). At Spurn on November 4th, a bird seen seemed to be immature (H.O.B.).

277. **SPARROW HAWK**.—This species is benefitting from absence of keepers in some areas. Of four pairs nesting near Ilkley one family of three was known to get away; another was destroyed and a further young bird shot (H. G. Williamson and W.F.F.).

284. **OSPREY**.—A bird was shot at Welton Springs in September (C.F.P. and D.C.U.).

289. **COMMON HERON**.—The heronry near Gargrave had 33 occupied nests on April 15th (J. A. Chadwick and W.F.F.). In Harewood Park on April 11th there were nine occupied nests in oak and three in beech; timber felling had driven the birds from their old site (W.B. and W.F.F.). About eight pairs nested at Gilling (A.C. Notes). In Shire Oaks Wood, on April 2nd, there were 14 nests (W.G.B.). There are no reports from Hubberholme, or Kiplin. At Hornsea Mere the watcher reported a slight increase in numbers (G.H.A.). The comparative frequency of single occurrences and birds seen at Swillington Ing, 17 on July 17th (A.G.P.), nine at Gowthwaite during most of December, eight at Trent-mouth in September, point to a possible slight increase; but the heronies uncounted make it impossible to check if increases are balanced by decreases. It is hoped to keep more complete counts in future of all Yorkshire heronries.

297. **BITTERN**.—A bird was seen twice near Hornsea Mere on September 15th (G.H.A. and J.L.). C. F. Procter reports two birds there on later dates.

300. **WHOOPEE SWAN**.—Two birds were last seen on Marishes floods near Pickering on January 14th (R.M.G.).

301. **BEWICK'S SWAN**.—At Coniston Cold two arrived on November 3rd and left during the night (R.T.).

303-7. **GREY GESE**.—About 400 passed north over Hutton-le-Hole at 2 p.m. on February 19th (R.W.C.). W. Ward reported about 1,000 flying north-west near Thornton Dale at 1-40 p.m. on February 19th (R.M.G.). In the Aire valley about 20 flew north-west at Methley on February 1st, and about 50 on February 19th (P.B.). Over Saltaire 25 flew westerly on January 20th, and 40 over Bingley on January 23rd; whilst on January 26th 28 flew easterly over Saltaire (S.L.).



Passage birds noted in autumn include high-flying skeins near Leeds on September 9th at 7-30 p.m., 62 birds flying south-west; seven flying south-east at 6-30 p.m. on September 18th, and 14 at 6-33 p.m., with three stragglers at 6-35 p.m. (K.D.). About 50 flew over Gorpel Reservoir on September 23rd (G. Chart). Some 200 birds flew high over York at 4-30 p.m. on October 27th (E.W.T.). Southward passage over Thornton Dale was reported from October 17th, intensified about October 29th and 31st. Birds were heard circling over Whitby at 11 p.m. on October 29th (R.M.G.). W. Ward reported the westward flight at Thornton Dale of 150-200 on November 12th. In the Humber area birds arrived at Swanland on September 23rd (B.B.); large flocks were about North Ferriby on September 29th. Two skeins flew west over Dairycoates at 7 a.m. on October 14th (E.C.). Between 3 p.m. and 5-30 p.m. on October 27th some 2,000 birds flew south and south-easterly over Eastdale. From Broomfleet towards Londesborough there were daily flights throughout November (F.C.N.). A skein of about 200 flew in from sea over Kilnsea on November 3rd (G.H.A.).

304. WHITE-FRONTED GOOSE.—C.F.P. reports this species among many small parties on the eastern Humber during November.

307. PINK-FOOTED GOOSE.—A bird was picked up dead at Swillington Ing on January 28th (H.F., I.M., V.S.C.). C. F. Procter reports larger numbers than usual in autumn on the Humber upper reaches. Present in large numbers in autumn on the Wolds and Humber (H.O.B.).

315. SHELD-DUCK.—A female was in the Vale of Pickering on February 18th (R.M.G.). Noted at Swillington Ing, one bird on March 18th (K.D., V.S.C.); two on July 15th, seven on December 9th (V.S.C., A.G.P., etc.). Three were on Winterset Reservoir (Ryhill) on October 6th (J.C.). At Spurn there were three pairs near Kilnsea Beacon on March 24th, and two parties of eight birds each on April 15th. One pair bred (G.H.A. and D.C.U.). Flocks up to 32 birds were seen in July and August (H.O.B.).

317. MALLARD.—Near to 1,000 birds passed much of the daytime on Leighton and Roundhill Reservoirs, in the last three months of the year (R.C.). At Coniston Cold on January 21st, 267 sat on the ice, and on February 1st there were 513; by April 29th 36 drakes and four ducks were left. On September 1st, 300 were counted with more on the island (R.T.). The Gorpel chart shows less variation between summer and winter with 148 (December 30th) as the largest number present.

318. GADWALL.—Six were identified at Stone Creek on September 16th (H.O.B.); a drake occurred at Swillington on September 6th (A.G.P.); and a duck was seen on Scarborough Mere on November 15th (T.N.R.).

319. TEAL.—A Teal ringed by G.R.E., V.S.C. and E.W. at Gorpel as young on June 18th, 1945, was recovered at Todmorden on August 15th. A Teal ringed at the Oriulton Decoy on January 9th, 1938, was shot at Horton, W. Yorks., on November 25th, 1945 (H. A. Gilbert in *The Shooting Times*). The highest numbers in autumn at Gorpel were 128 on October 6th during a light wind, and 75 on October 13th with a light wind, after which numbers fell again; but were up in December with 61 on the 2nd and 9th, and after two week-ends with only a few birds, were up to 109 on the 26th. Whether migration waves, or local movement caused the fluctuations is doubtful (G. Chart). Numbers at Coniston Cold were much fewer, although Mallard numbered more, 29 Teal on January 7th, and 39 on October 26th were the highest figures (R.T.). There were large numbers around Cherry Cob in November (G.H.A.).

323. WIGEON.—On the Leven Canal on March 31st a disturbed bird dived (E.C.). Although a surface feeder, pinioned Wigeons dive readily. Several pairs passed the summer at Stocks Reservoir but the keeper, Mr. Kean, said they were non-breeders (C.O.). A scarce bird at Gorpel, only noted on October 13th (one) and on December 9th (six) (G. Chart). Several small parties visited Coniston Cold in autumn, 23 seen on November 27th were still there on December 8th (R.T.). 33 were shot by one gun on the Humber on one evening in December (G.H.A.). Birds visited many inland waters as usual in small numbers; 50 had reached Swillington Ing by September 9th (A.G.P., K.D.). At Gowthwaite Reservoir numbers increased in November and December until there were some 200 birds there on December 19th (R.C.).

325. PINTAIL.—It seems strange that all references to this largely maritime species should come from the West Riding. At Swillington Ing both sexes occurred



on various dates from early January to March 18th, the largest number being ten birds on January 21st (A.G.P., K.D., V.S.C., etc.). In the autumn the first occurrence was on October 10th, after which the same observers reported small numbers regularly (eight on December 2nd, 9th and 15th). There were two drakes on Farnley Lake on November 27th (J.E.B.); and at Gorpel one on October 20th and two on December 9th (G. Chart); and six on the latter date at Winterset (K.W.).

326. **SHOVELER**.—Nested near Wakefield (K. S. Kilner), at Wassand (G.H.A.), and was seen in pairs at Fairburn and Swillington Ing (where probably robbed). Also occurred on various waters and dates in autumn, including Farnley Lake, Coniston Cold, Winterset and Leighton Reservoirs, etc.

328. **COMMON POCHARD**.—Normal numbers bred at Wassand (G.H.A.); and was normal in occurrences on waters throughout the county in autumn. At Coniston Cold 17 birds in January remained through a period of frost whilst the lake was covered by ice (R.T.). At Gorpel small numbers were present in January, three October 20th-27th; and no more until December 16th (G. Chart). At Gouthwaite small numbers were always present from early November (R.C.).

330. **TUFTED DUCK**.—Usually present on most waters of size. Six were noted off Scalby Point, Scarborough, on January 28th (K.G.P.). A bird occurred at Spurn on September 10th (E.W.W.).

331. **SCAUP-DUCK**.—Noted off Scalby Point, Scarborough, six females on January 28th (K.G.P.). Occurred at Gorpel on November 25th (three) and on December 2nd (two) (G. Chart). At Swillington Ing a pair was noted on March 12th (R.M.G. and R.C.); and on October 10th and 13th (K.D. and J.C.); and at Winterset a drake with several ducks on October 17th (K.W.).

332. **GOLDENEYE**.—Usually present at Gorpel Reservoir from October 20th, but not numerous until December 26th when nine appeared on the top dam and eight on the bottom one (G. Chart). Reported in late autumn and winter from many waters about Airedale, Wharfedale and Wensleydale—on the Wharfe near Otley there were 27 on November 14th, the largest number reported anywhere, which gradually decreased to about six at the year end (W.F.F.). A duck was shot on the Rye in October (A.G.).

334. **LONG-TAILED DUCK**.—Five were identified in Bridlington Bay on January 6th (G.H.A.).

337. **COMMON EIDER**.—South of Scarborough a pair appeared off shore on March 24th (D.E.S.).

339. **COMMON SCOTER**.—Several were seen at sea off Flamborough on January 7th (F.M.F.). 15 off Scalby Point, Scarborough, on January 28th included one drake (K.G.P.). 12 were seen at Spurn on September 10th (E.W.W.), and the species occurred generally throughout the autumn (G.H.A.). At Swillington Ing there were three adult drakes on July 12th, seven immature birds on November 24th, and five on the 25th allowed inspection from a few feet (A.G.P.). At Gorpel a party of ten were seen on July 8th (G. Chart).

340. **VELVET-SCOTER**.—At Hornsea Mere on October 21st a swimming female showed a white wing-bar and the characteristics of this species (J.C.).

342. **GOOSANDER**.—Goosanders visited the lake at Coniston Cold from January 13th to March 21st on many days; on January 18th there were 12 males and six females, which all dived together across the lake. A pair was there on April 22nd. In autumn a bird arrived on November 13th, and a pair on December 8th (R.T.). Two were seen in North Bay, Scarborough, on September 2nd (E. A. Wallis); and two females on Scarborough Mere on December 17th (T.N.R.). At Malham Tarn there were three females and a male on April 9th (C.E.A.B.). Both sexes were noted at Eccup on several dates in November and December (K.D.). Early in January, 1945, there were two on the Swale near Feetham (J.P.U.).

343. **RED-BREASTED MERGANSER**.—A bird was shot at Throxenby Mere on February 21st (W.J.C.). A party of three off-shore at Robin Hood's Bay on March 18th included an adult male (C.E.A.B.). Scarborough Mere showed three on December 5th and 6th (T.N.R.). A bird occurred at Spurn on November 11th (J.L.).

344. **SMEW**.—At Swillington Ing small numbers occurred from January 1st, being seen on different dates by A.G.P., K.D., E.W.W., I.M., V.S.C., R.M.G. and R.C.; five drakes and six ducks on January 14th were the largest numbers.

A female occurred at Gorples on January 21st (E.W.W.). At Hornsea Mere on December 12th there were four ducks and a drake (J.R.W.).

346. CORMORANT.—A bird at Swillington Ing on March 21st had white flank-spots (K.D.); it was also seen by A.G.P. on the 23rd. At Winterset Reservoir a bird occurred on April 26th (J.R.).

349. GANNET.—J. R. Artley, the Bempton climber, has not seen a bird there this year. Large parties were seen off-shore at Scarborough on July 12th and 19th, others were passing on September 19th (W.J.C.). There were numerous immature birds off Spurn during the first week of September (G.H.A.).

368. FULMAR PETREL.—First seen Scarborough Castle Rock on February 6th, 13 pairs, more than a month later than usual, probably due to weather conditions in January (R.M.G.). Odd birds were flying north at Kilnsea on May 20th and 26th (H.O.B.). C. H. Wells records six pairs between Sewerby and Bridlington of which two were almost certainly nesting—a bird was seen to change position and 'shuffle her breast feathers down on to the object under her.' After stormy weather, on December 3rd at 11-30 a.m., at Bingley, and later over the river at Cottingley Bridge, Mr. S. Longbottom watched a dozen Fulmars gliding round with stiff wings just as he had seen them at Scarborough. Some Herring and Black-headed Gulls were also there. The Fulmars were flying to a line of hawthorns, where Mistle-Thrushes continually drove them off, and which were the base of about 60 Redwings. S.L. reminds us of the record in *Birds of Yorkshire* of a Fulmar taken on a hook at Filey on October 26th, 1868, being found to have swallowed a Redwing.

370. GREAT CRESTED GREBE.—At Winterset Reservoir three on February 21st had ear tufts and tippets well developed. Birds were there on various dates; on July 25th there were 12 and a young bird, and on August 31st there were nine; and a single bird on September 28th and October 30th (J.R.). At Swillington on March 12th there were adults in breeding plumage and some winter-plumaged birds (R.C.). V.S.C. and K.D. counted 14 birds on the 18th, the largest number recorded on one day. Most passed on, and on April 28th there were only two pairs. On July 29th one pair had two small young (K.D.). Breeding was noted on Hornsea Mere (three pairs successful) (G.H.A.); and on Foss Reservoir near Ampleforth (A.C. Notes), but for the second year did not occur at Burton Constable (G.H.A.). A bird frequented tidal waters on the Esk in early March (C.E.A.B.); and one occurred off Spurn on November 18th (H.O.B.).

373. SLAVONIAN GREBE.—Birds visiting Swillington Ing were reported; one on November 11th (K.D.), two on November 11th (A.G.P., V.S.C., etc.), five on December 24th (E.W.W.).

374. BLACK-NECKED GREBE.—At Swillington Ing two were noted on January 21st (V.S.C.), seven birds in breeding plumage were noted on several dates in March (A.G.P.), and on April 8th (K.D.). Two birds were seen there on July 25th, one on August 26th (E.W.W.) and September 16th (K.D.). A party of 17 on October 7th were watched by V.S.C., H.F., W.B. and others, as the birds swam in a compact group with individuals diving repeatedly; all appeared to be in normal winter plumage.

375. LITTLE GREBE.—Six nests at Darfield had eggs (2, 2, 2, 2, 3, 5) on July 28th (T.M.F. and A.W.).

376. GREAT NORTHERN DIVER.—A bird wintered in the Scarborough Harbour vicinity, being first noted on December 31st, 1944, and remaining until the end of March (D.E.S.). One was seen on February 6th (probably the above-mentioned bird), and two on March 7th by R.M.G., who describes the steeply-angled forehead as a good field characteristic for distinguishing the winter bird from the Black-throated species. Just before it dived, almost at the moment of immersion, R.M.G. noticed the crown become flat, indicating that the forehead angle is produced by raised feathers and not by shape of skull. At Swillington, on October 26th an adult showed only the loss of the vertical neck stripes from full breeding plumage. It was the last day of severe gales (A.G.P.).

379. RED-THROATED DIVER.—There were several on the sea off Flamborough on January 7th and February 17th (F.M.F.). A bird remained in Whitby inner harbour for some days from February 20th (J.P.U.).

380. WOOD-PIGEON.—At Goathland, small parties arrived from east on February 27th (W.S.M.). Early nesting is recorded of a bird sitting on eggs on

March 18th near Barnsley (A.W.), two on March 21st, and another on the 30th (T.M.F.); and at Methley on April 2nd (P.B.).

381. STOCK-DOVE.—Two eggs are recorded in a nest near Barnsley on March 31st (T.M.F.); and at Methley on April 2nd (P.B.); and young at Gorples on April 15th (E.W.W.). A bird at Goathland in song on August 29th was unusual (W.S.M.).

383. TURTLE-DOVE.—Recorded at Methley on April 27th (P.B.). There were at least seven breeding pairs within one mile of Nunthorpe station in lower Teesdale where the species tends to increase (G.A.E.). Extending range in the Scarborough area (W.J.C.); a pair had reached Goathland on May 24th and others were reported later. Extension of range possibly due to forestry (W.S.M.). Bred successfully near Ampleforth (A.C. Notes). At Swillington there were 14 birds on September 9th and nine on the 16th. Last seen in the Sheffield area on September 18th (A.W.).

386. BAR-TAILED GODWIT.—Good views were obtained of a bird at Stocks Reservoir on August 16th by R. G. Spencer and C. Oakes. At Bridlington V.S.C. noted two on September 6th, and three on September 9th. Normal at Stone Creek (H.O.B.).

387. BLACK-TAILED GODWIT.—At Winterset Reservoir on September 28th one fed with Redshanks (J.R.). A single bird occurred at Stone Creek on August 22nd (H.O.B.).

388. COMMON CURLEW.—About 50 flew eastward five miles off-shore from Flamborough on February 21st (F.M.F.). At Gorples a bird flew over on January 28th, and the main party came on February 23rd (E.W.W.). In Swaledale on March 14th a flock of 72 birds came down to a pasture (J.P.U.). Four pairs bred on low ground near Ampleforth (A.C. Notes). Bred commonly down to the lowland fields near the Lancashire border about Sawley (C.O.). Birds appeared at Swillington Ing on various dates from early August, on the 28th there were 21 present (A.G.P.). Possibly unusual in respect of dates inland were eight birds near Kettlewell on October 15th (J.R.), two at Gouthwaite Reservoir on November 30th and December 2nd (R.C.), two at Chelker Reservoir on November 25th (W.F.F.), and five birds in a wet field near to the Swale below Great Langton on December 30th (J.P.U., R.C.). Fairly numerous at Spurn on September 15th and 29th and on November 11th (G.H.A.).

389. WHIMBREL.—A bird occurred at Swillington Ing on May 7th (A.G.P.). The first autumn record was at Kilnsea on July 14th (H.O.B.); after which occurrences were normal at Stone Creek and Spurn.

393. WOODCOCK.—'Roding' was noticed at Coniston Cold on March 12th (R.T.). Breeding areas tend to spread. Nests were found near Barnsley on April 3rd, and near Sheffield on April 22nd (A.W.); and at Grassington and Bolton Woods; and near Mytholmroyd (W.G.). At Brantingham a bird had three young on May 7th (L.A.G.); and a pair had four eggs in Hartoft Dale in June (R.M.G.). There were many at Spurn on November 2nd (H.O.B.); and 23 birds were flushed on the 3rd (G.H.A.).

398. JACK SNIP.—A bird had arrived at Keld Head, Pickering, on September 29th, where 12 were flushed on November 23rd (R.M.G.).

402. TURNSTONE.—A bird occurred at Gorples on May 9th (E.W.W.). First noted on autumn passage at Kilnsea on July 22nd; eight birds were at Spurn throughout December (G.H.A., J.L., J.R.W.). A bird was noted at Bridlington on September 6th (V.S.C.).

403. KNOT.—There were 50 birds at Spurn on April 15th, where it was numerous on November 17th and December 16th (G.H.A. and J.L.). A bird occurred at Swillington Ing on September 2nd (A.G.P.).

404-5. DUNLIN.—Three seen on Ilkley Moor on June 10th (W.F.F.), and reported as usual at various inland calling places; at Gorples on May 6th a party numbered 46 (E.W.W.). A flock at Spurn on December 27th was very large (G.H.A. and J.R.W.).

406. CURLEW-SANDPIPER.—A bird at Swillington Ing on May 7th was in breeding plumage; birds also occurred there on September 6th and 11th (A.G.P.).

407. LITTLE STINT.—K.D. got within ten feet of two at Swillington Ing on September 2nd, as they fed in company with three Ruffs. On Cherry Cob Sands, G.H.A. and J.L. watched a bird at close quarters on October 6th.



415. PURPLE SANDPIPER.—11 were seen on Scalby Ness Point on March 31st (D.E.S.). A dozen birds frequented the rocks below Castle Cliff, Scarborough, during the autumn (W.J.C.). At Bridlington a small party frequents the rocks below the south pier; on April 28th there were 12 or more, and four on December 2nd and 22nd (C.H.W.).

416. SANDERLING.—At Gorple two occurred on May 9th (G. Chart); and four at Bridlington on September 6th (V.S.C.). Four Sanderlings kept together on the outskirts of a feeding flock of mixed Dunlins and Ringed Plovers at Trentmouth on September 12th (R.C.). A few occurred at Spurn from September 29th onwards (G.H.A., J.R.W.). There were large numbers on Bridlington sands on December 29th (G.H.A.).

417. RUFF.—A female was seen in the Vale of Pickering on March 1st, 4th and 29th (R.M.G.). At Swillington Ing small numbers (six on September 9th being the largest) were seen from August 19th on various dates to September 22nd (K.D., A.G.P., J.E.B., T.R.T., R.C.). Two were seen on old sewage beds near Knowsthorpe, Leeds, on September 8th; and four near Dewsbury on October 3rd (J.C.).

421. COMMON SANDPIPER.—A bird ringed at Gorple as young on June 16th, 1945, by Edwards, Crapnell and Watson, was recovered at Stotfold (Beds.) on July 29th, 1945. Gorple also appropriately saw the earliest arrival on April 15th (E.W.W.). At Spurn the first autumn bird was noted on July 14th (H.O.B.).

424. GREEN SANDPIPER.—After noting two on February 11th, H.O.B. saw eleven on the River Hull near Driffield on February 18th. July 7th at Spurn was an early date for this species (H.O.B.), where it was subsequently seen often up to September 29th (G.H.A. and J.L.). A bird also occurred at the Scalby Beck, near Scarborough, in July (W.J.C.). On August 11th three occurred by a pool on the Saltersgate Moors and flew south when flushed; on the 14th there was a bird on the Costa Beck at Pickering (R.M.G.). At Swillington Ing the species was first recorded on August 5th (E.W.W.); after which it was seen many times up to September 29th by several observers. At Stocks Reservoir three were flushed on August 19th (C.O.); and one at Dewsbury Sewage Farm on September 8th (J.C.).

428-9. REDSHANK.—Autumn flocks at Spurn seem to be smaller now than pre-war, in 1939 they numbered up to 200 birds in August. At Swillington Ing about 50 birds were seen on July 25th (K.D.).

431. SPOTTED REDSHANK.—A bird noted among Common Redshanks at Swillington Ing on July 25th gave the call of this species when it flew (K.D.). A bird occurred at Kilnsea on August 6th (H.O.B.).

432. GREENSHANK.—Noted at Stone Creek on the Humber on May 9th (H.O.B.); and near Kilnsea Beacon on September 15th and 29th (G.H.A. and J.L.). A bird occurred on the Rye below Helmsley on September 12th (E.W.T.). Greenshanks were generally present at Swillington Ing from July 25th (K.D.) until October 17th with seven as the largest number seen on one day. At Trentmouth two birds were present all morning on September 9th; and were seen to mount high and fly up the Trent in afternoon (R.C.). Near Halifax a bird was seen at Ogden Reservoir on August 12th (J.M.).

435. RINGED PLOVER.—Bred normally about Spurn (G.H.A.).

440-41. GOLDEN PLOVER.—A dozen birds flew on September 10th from the direction of the Ouse near Goole towards the half-mile distant Trent near Garthorpe (R.C.). Reports of smaller numbers in Wharfedale this winter than usual (W.F.F.) are balanced by the opposite in lower Airedale (A.G.P., K.D., etc.).

444. GREY PLOVER.—30 birds at Spurn on April 15th had partially assumed summer dress (G.H.A., D.C.U.). Present at Spurn throughout autumn (G.H.A.). A bird occurred at Gorple on October 6th (E.W.W., D.M.); and three at Swillington on December 8th (K.W.).

449. LAPWING.—A bird recovered at Preston (Lancs.) on December 31st, 1944, had been ringed at Harrogate as young on June 6th, 1941, by P. Hirst (Miss E. P. Leach in *British Birds*). Many birds seen at sea off Flamborough in fog on February 17th appeared to be lost (F.M.F.). Very numerous in the Vales of Mowbray and York in autumn gradually decreasing as flocks flew south-west (R.C.). There were large flocks about Easington and Kilnsea during December (G.H.A.). Breeding stocks have become reduced in many parts of the county (R.C., G.H.A.); including the Helmsley area (A.G.).



452. **BRITISH OYSTERCATCHER.**—Three young were reared in an oatfield at Kilnsea (H.O.B.). 16 occurred at Spurn on April 15th (G.H.A. and D.C.U.), and a bird occurred by the lake at Coniston Cold on April 18th (R.T.). Nested near Austwick (C.A.C.), and on the Ribble near Sawley where two pairs were present from April 15th, egg-shells were found on May 27th, and an adult with young able to fly seen on June 24th (C.O.). Five birds stood on the mud at Trentmouth on September 10th (R.C.). A bird was seen by Eshton Tarn on July 5th (J.E.B.).

462. **BLACK TERN.**—A bird in full breeding plumage occurred at Gorples Reservoir on the early date of April 15th (E.W.W.). A bird of this species was seen with other terns at Spurn on September 6th (R.M.G., C.E.A.B. and G.H.A.).

467. **SANDWICH TERN.**—A bird was seen at Spurn on May 13th (H.O.B.). Passage down the coast in August and September was noted at Bridlington (V.S.C.), and at Spurn (G.H.A., C.E.A.B., R.M.G.).

469-70. **COMMON AND/OR ARCTIC TERN.**—Single birds were noted at Darfield on May 16th (T.M.F.); and at Swillington Ing on May 20th (K.D.). A large passage south occurred at Spurn on August 16th, September 6th, and later in the month (G.H.A.).

471. **LITTLE TERN.**—About 75 pairs bred in three colonies about Spurn, the main colony being north of the Lighthouse, where it was in the early part of this century (G.H.A., H.O.B., D.W.).

478. **BLACK-HEADED GULL.**—A Swaledale gullery on July 10th had 118 nests—49 with one egg, three with two eggs, one with three eggs, 16 held young, and there were 12 young birds on the water (J.P.U.). At Gorples Reservoir flooding and nest robbing prevented breeding, but one pair nested on an anti-invasion barrel moored 100 yards from shore (E.W.W.). Generally decreased in the East Riding (G.H.A.). Among birds at Eccup on December 23rd was one with a complete dark head and another with a partially-developed hood (K.D.).

481. **COMMON GULL.**—Noted inland in winter at various places, particularly during severe weather. Four noted at Gorples on July 29th, and five on August 4th (G. Chart).

482. **HERRING GULL.**—Bred more numerous at Bempton (J. R. Artley).

485. **BRITISH LESSER BLACK-BACKED GULL.**—About ten pairs attempted to breed on an island in Stocks Reservoir, but acting on instructions to prevent colonisation, the keeper took the eggs, and also of the Black-headed Gulls that attempted to nest. First noted passing north near Whitby on March 20th (C.E.A.B.). On various dates between March 30th and May 6th, parties of birds flew westerly over the Lancashire-Yorkshire boundary near Sawley apparently from Airedale, towards the Lancashire gulleries. 41 were counted on April 22nd, 38 on April 29th; and the counter (Mr. Clifford Oakes) wondered what totals a daily complete count would give. He has no doubt the birds travelled from the Humber. 14 were noted at Swillington on June 20th, and two on the 16th (K.D.). No birds are reported as breeding on the Yorkshire cliffs although a few were seen on cliffs north of Flamborough during July (G.H.A.). A single bird was seen on several dates in October and November and on December 26th (G. Chart).

486. **GREAT BLACK-BACKED GULL.**—Several birds were at Swillington Ing on January 1st (E.W.W.); one on January 7th, and on November 11th (K.D.). Numbers were seen off Flamborough on January 7th (F.M.F.). One occurred on Winterset Reservoir on August 31st (J.R.). The species was numerous at Spurn from September 15th onward; and in the fields near Beverley on December 24th (G.H.A.).

487. **GLAUCOUS GULL.**—There were several in Scarborough Harbour during January (W.J.C.); and one nearby in late December (T.N.R.). There was an immature bird at Bridlington on January 6th (G.H.A.). Immature birds were seen near Spurn on March 31st, November 11th (H.O.B.), two on December 16th (G.H.A. and J.L.), and one on the 27th (G.H.A. and J.R.W.). A mature bird was noted off Spurn on December 2nd (G.H.A.).

488. **ICELAND GULL.**—In the Humber Estuary near Spurn Point on January 30th, a lightly-freckled bird in the company of Herring Gulls had wings projecting noticeably beyond the tail when settled on the water (F.M.F.). An adult frequented Scarborough Harbour during February (W.J.C.). At Bridlington pier on January 5th, standing with Herring Gulls, were two immature birds of same

size, of uniform creamy-brown colour and without a tail-band—they were thought to be of this species (G.H.A.).

489. KITTIWAKE.—J. R. Artley, the climber, reports a notable decrease in numbers of birds nesting at Bempton and Speeton. The colony on Scarborough Castle Rock showed an increase this year (W.J.C.). Two occurred at Gorple on January 21st; and one on October 6th (G. Chart). Many dead birds of the year were noted at Filey on August 12th (E.W.T.).

493. ARCTIC SKUA.—Two birds, probably of this species, were seen near Spurn on August 18th, and one on September 9th (H.O.B.). One on September 4th pursued a Little Tern (G.H.A.). On the same day R.M.G. and C.E.A.B. saw two birds; and one was seen near Kilnsea on October 28th (J. Lowes).

496. RAZORBILL.—Numbers were seen off Flamborough on January 7th (F.M.F.). A bird passed northward at Kilnsea on April 21st (H.O.B.).

498. NORTHERN GUILLEMOT.—Six birds on Saltwick Nab on February 25th were black and considered of this race (J.P.U.). A bird at Scarborough on October 2nd was thought to be in its first winter (T.N.R.). A live bird picked up on Bridlington sands on December 29th was of this race. When returned to the sea it swam away (G.H.A.).

499. SOUTHERN GUILLEMOT.—Numbers were seen off Flamborough on January 7th (F.M.F.). Climbers report breeding birds to be up to the average of recent years (G.H.A.).

502. LITTLE AUK.—The following inland occurrences followed storms. January 11th, caught alive in a beck at Normanby near Eston. January 4th, caught alive in a Scarborough street; and another a few days later on the south beach (W.J.C.). Picked up dead at Goathland on January 20th (W.S.M.). Caught alive at Lazenby near Eston on January 31st (O.C.H.).

503. SOUTHERN PUFFIN.—Numbers were seen off Flamborough on January 7th (F.M.F.). J. R. Artley reports a slight increase on the Bempton cliffs (G.H.A.). A live bird was brought to the Dorman Memorial Museum, Middlesbrough, on November 1st. It had been found running on the road at Aclam, injured probably by wires (O.C.H.).

504. CORNCRAKE.—A pair nested in Duncombe Park, the first noted in this area for many years (A.G.). The species was heard calling at Askwith on June 11th and 25th (W.F.F.). A bird called all summer near Dewsbury (F.H.E.). Was also heard at Ingleton on June 11th (Mr. J. P. Biggin per E.H.), near Sedbergh in July (T.R.T.), in Swaledale on June 29th, and was also reported from Arken-garthdale (J.P.U.), Hunmanby, on July 21st, and near Runswick Bay during summer (W.J.C.).

509. WATER-RAIL.—A bird was seen in Swillington Park on January 28th (H.F., I.M., V.S.C.). One found dead near Keighley on September 22nd had evidently collided with wires (E.H.). A bird was heard at Farnley Lake on September 17th (T.R.T., J.E.B.). On September 1st a bird was seen in Pickering Beck, in the middle of the town (E.C.). One occurred on the cliffs near Whitby on September 12th (C.E.A.B.). At Keld Head, Pickering, there were two on November 23rd (R.M.G.); and one at Ossett Spa S.F. on September 21st (K.W.).

511. COOT.—Large numbers wintered at Winterset Reservoir from January to March, 1945; on April 26th only two were visible (J.R.). About 160 were at Farnley Lake on December 5th (J.E.B., W.F.F.). About 120 were in winter quarters at Gouthwaite Reservoir from early November (R.C.).

513. BRITISH BLACK GROUSE.—Eight greyhens and one blackcock roosted in birches in Swaledale on December 14th, 1944 (J.P.U.).

519. RED-LEGGED PARTRIDGE.—Chicks were seen at Spurn on August 16th and a covey on November 25th (H.O.B.). A nest with ten eggs was found in summer on a wheatstack in a Dutch barn, close under the roof and about 22 feet from the ground, at Brandsby (H. M. Shepherd-Cross in *The Field*).

520. QUAIL.—A bird was heard near Levisham on May 30th, for the fourth year in succession (R. Green). J. Curson described a party of five birds on July 26th near Bempton cliffs, which flew out over the sea and returned to the field (G.H.A.). A nest was found in a grass field near Hunmanby on July 21st; two unblown eggs were brought for confirmation (W.J.C.). D. Green reported a bird at Thornton Marishes on September 17th (R.M.G.). Two were reliably reported in the gutter of a Whitby street on June 1st (W.S.M.). Two were flushed from roots during Partridge shooting in September near Carlton (A.G.).

## MYCOLOGISTS AT THORNTON-LE-DALE

WILLIS G. BRAMLEY, JOHN GRAINGER AND JENNIE GRAINGER

SUNNY weather and members of the British Mycological Society combined to make this foray one of the most successful ever held in Yorkshire. The success, however, was largely at the expense of the Agarics, since the droughty conditions reduced their numbers.

The Mycological Committee has elected Mr. W. D. Hincks to be its next Chairman, but otherwise retains its present personnel with the additions of Mr. and Mrs. E. W. Mason, Dr. Sledge, and Professor Chesters as members. It was decided to invite the following authorities to act as referees in the groups of fungi which are their special study: Mr. A. A. Pearson, Agarics and Boleti; Miss E. M. Wakefield other Basidiomycetes; Mr. W. G. Bramley, Rusts and Smuts; Mr. E. W. Mason, Pyrenomycetes; Dr. R. W. G. Dennis, Discomycetes; Mr. S. J. Hughes, Coprophilous Fungi; Mr. T. Petch, Entomogenous Fungi; Dr. J. Grainger, Plant Diseases and Ecology.

Mr. A. A. Pearson delivered his Chairman's Address before the Annual Meeting of the Committee on Saturday, October 6th. He dealt in detail with classification of the Boleti, announced a welcome reduction in the number of valid species, and outlined the basis for a revised systematic orientation of the remainder. It is expected that publication of full details of this work will not be long delayed.

'Mycology in All Weathers,' the title of a paper by Dr. John Grainger (October 7th), proved to be an analysis of the effects of various meteorological factors upon the growth and fructification of fungi. Many fungi only become severely pathogenic when atmospheric humidity reaches 100 per cent. *Erysiphe graminis* on oats and *Botrytis cinerea* on beans are examples. On the other hand, dry conditions seem to be necessary for the parasitism of many rust fungi. *Otidea leporina* fructifications and most fleshy fungi are destroyed by frost, but *Collybia velutipes* appears to withstand even a severe freezing. Temperatures below freezing point also seem to be necessary for the development of stromata on *Ergot sclerotia*, *Claviceps purpurea*. Rainfall, soil temperature and nitrogen content of the soil exert a tripartite effect upon the fructification of the larger fungi. Maximum fruiting in October is correlated with the only time in the year when these three factors are collectively adequate.

The district was notable for the frequency of alkaline soil habitats, though in all the excursions of this foray, very acid soils could also be found. In Ellerburn, for example, *Lepiota procera* was found on soil of pH. 4.5, *Tricholoma argyraceum* favoured ground of pH. 7.5, while *Inocybe geophylla* var. *lilacina* occurred on a substrate of pH. 8.0. *Otidea luteo-nitens* was another calcicolous species. It now seems fairly clear that distribution of terrestrial Agarics depends in good measure upon the pH. of a particular habitat. Detailed localities have, therefore, not been included in the list below.

The nursery beds of forest seedlings at Dalby Dale and Wykeham yielded *Boletus viscidus* (= *laricinus*) always in association with Japanese Larch, and *Hebeloma crustuliniforme* var. *minor* Cke., chiefly on beds of Sitka Spruce. This close association should be noted for its possible mycorrhizal implications; there seems no reason as yet to suppose any pathogenic relationship.

Mr. E. W. Mason contributes the following: \*

'Of the Pyrenomycetes recorded, several are of interest; *Anthostoma microsporium* Karsten. on Alder was compared with Karsten's material from Finland; it has not previously been recorded for Britain under that name. *Nummularia lutea* occurred in its typical habitat on the collar of dead *Buxus*. According to C. L. Shear, these two species should be called *Camarops microspora* and *C. tubulina* respectively. The British material will no doubt be better understood when Professor Chesters has published on British *Anthostoma*.

*Tympanopsis euomphala* is added to the Yorkshire list with great satisfaction, as it has been closely searched for during the forays of the last two years. It was found by Mr. Hughes in its characteristic habitat—mature branches of *Fraxinus* well rotted by *Hyphoxylon rubiginosum*.

'*Ophiostoma piceae* was found forming both its perithecia and its *Graphium* synnemata. *Ophiostoma*, no doubt, abounds in Yorkshire; the difficulty is usually to identify the material to its species. *Chaetosphaeria phaeostroma* was found as usual in association with various species of Diatrypaceae, and so was *Calyculosphaeria tristis*.



'As in 1930 Kingthorpe Wood again provided a fine collection of the rarely recorded *Xylaria longipes* on Sycamore trunks; spore measurements show that it is quite distinct from the widely distributed *X. polymorpha*. *Eutypella sorbi* on Mountain Ash was also again common there; it appears to be recorded from Britain only in Yorkshire.

'Semi-permanent preparations of most of the Hyphomycetes mentioned are preserved in the Herbarium of the Imperial Mycological Institute, a number were made during the Foray. *Menispora tortuosa* Corda appears to be new for the county and the country; it is distinct from *M. ciliata*. *Stachylidium bicolor* appears not to have been recorded since 1836; it was found at the Forge Valley foray last year but not recorded, and has also since then been found at Kew; it is distinct from *Stachylidium extor* already recorded for Yorkshire on *Petasites*. *Pachnocybe clavulata* was once sent to W. B. Grove from Mulgrave, and identified; it is included in the British list as *Graphium grover* Sacc. It is, however, not a *Graphium* and its earliest epithet is not *grovei*. *Fusidium viride* was collected in Yorkshire first by Crossland on decaying *Petasites* stem, Halifax, November, 1898. Throughout the county, many have seen *Botryosporium pulchrum* during this autumn, but Kingthorpe Wood can hardly have been bettered; for over a hundred yards the stems of *Urtica* were covered with it, and clouds of its white conidia marked the track of every forayer.'

We gratefully record our thanks to Mr. Mason, Mr. A. A. Pearson and Mr. Hughes for their help in naming species and in the preparation of lists. Dr. R. W. G. Dennis also named *Uromyces genistae-tinctoriae* on Laburnum.

T. = Thornton-le-Dale.	D. = Dalby Dale.
K. = Kingthorpe Woods.	F. = Forge Valley.
M. & G. = Mason and Grainger.	* = New to V.C. 62.
W. = Wykeham.	† = New to Yorkshire; not listed in M. and G.

## MYXOMYCETES

### MYXOGASTRALES

<i>Physarum nutans</i> Pers.	<i>Lycogala epidendrum</i> Fr.
<i>Leocarpus fragilis</i> Rost.	<i>Trichia persimilis</i> Karst.
<i>Comatricha nigra</i> Schroet.	<i>T. varia</i> Pers.

### PHYTOMYXALES

<i>Plasmodiophora brassicae</i> Woron.	<i>Spongospora subterranea</i> (Wallr.) Lagerh.
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## PHYCOMYCETES

### PERONOSPORALES

<i>Phytophthora infestans</i> (Mont.) de Bary.	<i>Peronospora parasitica</i> (Pers.) Tul., on <i>Capsella Bursa-pastoris</i> .
<i>Cystopus candidus</i> (Pers.) de Bary, on <i>Capsella Bursa-pastoris</i> .	<i>P. effusa</i> (Grev.) Rabenh., on <i>Chenopodium album</i> .
* <i>Plasmopara pusilla</i> (de Bary) Schroet., on <i>Geranium sylvaticum</i> .	† <i>P. alsinearum</i> (Casp.), on <i>Stellaria media</i> and <i>Spergula arvensis</i> .
<i>Bremia lactucae</i> Regel., on <i>Lactuca muralis</i> and <i>Lapsana</i> .	

### MUCORALES

<i>Spinellus fusiger</i> (Link.) van Tiegh., on <i>Mycena</i> .	<i>Pilobolus crystallinus</i> (Wigg.) Tode.
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## ASCOMYCETES

### ERYSIPHALES

<i>Podosphaera oxyacanthae</i> (DC.) de Bary.	<i>E. polygoni</i> DC., on <i>Pisum sativum</i> , <i>Trifolium medium</i> , and <i>Sonchus oleraceus</i> .
<i>Erysiphe galeopsidis</i> DC., on <i>Stachys sylvatica</i> .	<i>E. polygoni</i> DC. (oidium stage only), on <i>Myosotis</i> and <i>Lamium</i> .
<i>E. cichoracearum</i> DC., on <i>Heracleum Sphondylium</i> and <i>Arctium lappa</i> .	<i>Microsphaera grossularia</i> (Wallr.) Lév.
<i>E. graminis</i> DC., on wheat and <i>Dactylis</i> .	<i>Uncinula aceris</i> (DC.) Sacc.



## DISCOMYCETES—OPERCULEAE

*Helvella crispa* (Scop.) Fr.  
*Rhizina inflata* (Schaeff.) Karst.  
*Galactinia Saniosa* (Schrad.) Sacc.  
*Otidea luteo-nitens* (B. et Br.) Massee.  
*O. aurantia* Pers. var. *atromarginata*  
 Phil. et Plowr.

*Lachnea hirta* Gillet.  
 \**L. scutellata* (Linn.) Gillet.  
 †*Humaria granulata* Sacc.  
*Ascophanus carneus* (Pers.) Boud., on  
 dung.

## INOPERCULEAE

*Geoglossum ophioglossoides* (Linn.)  
 Sacc.  
*Leotia lubrica* (Scop.) Fr.  
*Coryne sarcoides* (Jacq.) Tul.  
*Bulgaria inquinans* (Pers.) Fr.  
*Polydesmia pruinosa* (Berk. et Br.)  
 Boud., with *Diatrypella quercina*,  
 on *Quercus*.  
*Sclerotinia sclerotiorum* (Schröet.) Mass.  
*S. fructigena* Rehm., on apple.  
*Chlorosplenium aeruginosum* (Oeder)  
 de Not.

*Helotium fructigenum* (Bull.) Fuckel.  
*H. virgultorum* var. *fructigenum* Rehm.  
*H. citrinum* Fr.  
*Dasyscypha calycina* = *Trichoscypha*  
*calycina* (Schum.) Boud.  
*Mollisia cinerea* (Batsch.) Fr.  
*Pseudopeziza trifolii* (Biv.-Bern.)  
 Fuckel.  
*P. ranunculi* (Wallr.) Fuckel.  
*P. repanda* (Fr.) Karst.  
*P. ribis* Kleb., on gooseberry and  
 current.  
*Rhytisma acerinum* (Pers.) Fr.

## HYSTERIALES

*Lophodermium pinastri* (Schrad.) Chev.  
 on Corsican Pine.

*Gloniopsis curvata* (Fr.) Sacc. on *Rosa*  
 sp. T. [M. and G., sub. *Hysterog-*  
*raphium*].

## PYRENOAMYCEALES

*Nectria cinnabarina* (Tode. ex Fr.)  
 Fr., on *Acer pseudoplatanus* F.  
*Nectria inventa* Pethybr. Conidial  
 only on umbelliferous stems. F.  
 [M. and G., sub. *Acrostalagmus*  
*cinnabarinus* Corda].  
*Dialonectria sanguinea* (Sibth. ex Fr.)  
 Fr., on *Diatrype stigma*, on *Sorbus*.  
*Hyponectria buxi* (Desm.) Sacc.  
 \**Gibberella cyanogena* (Desm.) Sacc., on  
*Urtica*. T.  
*Epichloë typhina* (Pers. ex Fr.) Tul.  
*Claviceps purpurea* (Fr.) Tul., on  
*Holcus lanatus*, *H. mollis*, *Molinia*  
*coerulea*, *Dactylis glomerata* and  
*Lolium perenne*.  
 †*Phyllachora dactylidis* Delaer., on  
*Dactylis glomerata* (M. and G., sub.  
*P. graminis*.)  
*Chaetomium elatum* Kunze et Schmidt  
 ex Fr., on wheat straw.  
*Trichosphaeria myriocarpa* (Fr.) Petr.  
 and Syd., on wood. K. [M. and  
 G. as *T. minima* a later synonym.]  
*Rosellinia mammiformis* (Pers. ex  
 Fr.) Ces. and de Not., on *Hedera*.  
 T.  
*Bertia moriformis* (Pers. ex Fr.) de  
 Not., on wood. K.  
*Lasiosphaeria ovina* (Pers. ex Fr.) Ces.  
 and de Not., on wood. K.  
*L. spermoides* (Hoffm. ex Fr.) Ces. and  
 de Not., on wood. T. With *Armil-*  
*laria* [M. and G., sub. *Leptospora*].

*Chaetosphaeria phaeostoma* (Dur. and  
 Mont.) Fuckel., on *Acer*, *Fagus*,  
 and other wood associated with  
*Diatrype stigma* and with *Eutypa*  
*flavovirens*.  
*Melanomma pulvispyrius* (Pers. ex  
 Fr.) Fuckel., on *Sorbus aucuparia*.  
 D.  
 †*Ophiostoma piceae* (Münch.) Syd., on  
 conifer log. D.  
 †*Ceratostomella vestita* Sacc., on *Quercus*  
 wood. K.  
 †*Tympanopsis euomphala* (Berk. and  
 Curt.) Starb., on *Fraxinus*, with  
*Hypoxylon rubiginosum*. K.  
 \**Calyculosphaeria tristis* (Fuckel.)  
 Fitzp., with *Diatrype stigma*, on  
*Crataegus*. T. [M. and G. sub.  
*Nitschkia*.]  
*Mycosphaerella fragariae* (Tul.) Lindau.  
*Venturia inaequalis* (Cke.) Aderh.  
*Physalospora mutila* (Fr.) N. E.  
 Stevens, pycnidial only, on *Ulmus*.  
 F.  
*Valsa ambiens* (Pers. ex Fr.) Fr., on  
*Crataegus*. T.  
 †*Anthostoma gastrinum* (Fr.) Sacc., on  
*Ulmus*. K.  
 †*A. microsporum* Karst., on *Alnus*  
*glutinosa*. F.  
*A. turgidum* (Pers. ex Fr.) Nits., on  
*Fagus*. T.  
*Melanconis stilbostoma* (Fr.) Tul., on  
*Betula*. D.

## PYRENOMYCETALES—continued

- Pseudovalsa lanciformis* (Fr.) Ces. and de Not., on *Betula*. D.  
*Diaporthe leiphaemia* (Fr.) Sacc., on *Quercus*.  
*D. decedens* (Fr.) Fuckel., on *Corylus*.  
*D. pustulata* (Desm.) Sacc.  
† *Cryptosphaeria eunomia* (Fr.) Fuckel., on *Fraxinus*. T.  
*Diatrype stigma* (Hoffm. ex Fr.) Fr., several collections.  
*D. disciformis* (Hoffm. ex Fr.) Fr., on *Fagus*. T.  
*Diatrypella favacea* (Fr.) Ces. et de Not., on bark. T.  
*D. quercina* (Pers. ex Fr.) Fr., on *Quercus*. K.  
† *Eutypa flavovirens* (Pers. ex Fr.) Tul., on wood. K.  
† *Eutypa sorbi* (Schmidt ex Fr.) Sacc., on *Ulmus*. F.  
*E. prunastri* (Pers. ex Fr.) Sacc. T.  
*E. stellulata* (Fr.) Sacc., on *Ulmus*. F.  
\* *Quaternaria dissepta* (Fr.) Tul., on *Ulmus*. T.  
*Q. quaternata* (Pers. ex Fr.) Schroet., on *Fagus*. T.  
*Nummularia lutea* (Alb. and Schw.) Nits., on *Buxus sempervirens*. K.  
*Hypoxylon coccineum* Bull., on *Fagus*. K.  
*H. fuscum* (Pers. ex Fr.) Fr., on *Corylus*. T.  
*H. multifforme* (Fr.) Fr.  
*H. serpens* (Pers. ex Fr.) Fr.  
*Xylaria hypoxylon* (L. ex Fr.) Grev., on wood. T. and K.  
*X. longipes* Nits., on *Acer pseudoplatanus*. K.  
*X. polymorpha* (Pers. ex Fr.) Grev., on wood. K.

## BASIDIOMYCETES

## USTILAGINALES

- \* *Ustilago perennens* Rostr., on *Arrhenatherum avenaceum*.  
*Urocystis anemones* (Pers.) Wint., on *Ranunculus repens*.

## UREDINALES

- Thecopsoa galii* De Toni, II, on *Sherardia arvensis*. T.  
*T. vaccinatorum* (DC.) Lagerh., on *Vaccinium myrtillus*. W.  
*Pucciniastrum agrimoniae* (Schw.) Tranzsch., II, T.  
\* *P. pustulatum* Diet., II, III, on *Epilobium angustifolium*.  
*Melampsorium betulinum* (Pers.) Kleb. W. II.  
*Coleosporium senecionis* (Pers.) Fr., II, III.  
\* *C. tussilaginis* Tul., II, III.  
*C. sonchi* Lev., II, III.  
*C. campanulae* Lev., II.  
*Melampsora* sp., on *Populus alba*.  
*M. larici-populina* Kleb., III, on *Populus nigra*. D.  
*Phragmidium sanguisorbae* Schroet., II, III.  
*P. violaceum* Wint., II, III, on *Rubus fruticosus*. T.  
*P. rubi* (Pers.) Wint., II, III, on *Rubus fruticosus*. T., F.  
*P. disciflorum* James, II, on *Rosa canina* (= *mucronatum* Wint.). T.  
*Uromyces flectens* Lagerh. T.  
*U. loti* Blytt., II, D.  
\* *U. pisi* (Pers.) Wint., II, on *Lathyrus pratensis*. D., T.  
*U. geranii* Otth. et Wart., III, on *G. pratense*. T.  
*U. rumicis* (Schum.) Wint., II, III, on *Rumex obtusifolia* and *R. crispus*.  
*U. acetosae* Schroet., II, on *Rumex acetosella*.  
*U. polygoni* (Pers.) Fuckel., III.  
*U. dactylidis* Otth., III.  
*U. poae* Rabenb., III, on *Poa trivialis*.  
*U. genistae-tincitoriae* (Pers.) Wint., II, III, on *Laburnum vulgare*. W. New British host.  
*Puccinia centaureae* DC., on *Centaurea nigra*.  
† *P. cirsi-lanceolati* Lasch.  
*P. obtegens* Tul.  
*P. lapsanae* Fuckel.  
*P. leontodontis* Jacky., II, III, on *L. hispidus*. D., T.  
*P. chondrillae* (Pers.) Corda, on *Lactuca muralis*.  
*P. taraxaci* Plowr., III, on *Taraxacum*. T.  
*P. sonchi* Rob., II, III, on *Sonchus arvensis* and *S. oleraceus*. D., T.  
*P. valantiae* Pers., III, on *Galium cruciatum*.  
*P. veronicae* Schroet., III, on *Veronica montana*.  
*P. menthae* Pers., II, III, on *Mentha arvensis*. T.  
*P. annularis* Schlecht., on *Teucrium Scorodonia*. D.  
*P. saniculae* Grev.  
\* *P. chaerophylli* Purt., on *Myrrhis odorata*.  
*P. violae* (Schum.) DC., on *V. Riviniana* and *V. cornuta*. D., T.

## UREDINALES—continued

- Puccinia malvacearum* Mont., on *Althaea rosea*. T.  
*P. caricis* (Schum.) Rab., II, III, on *Carex pendula*. F.  
*P. pruni-spinosae* Pers., II, III, on Plum and *Prunus spinosa*. T.  
*P. lychnidearum* Link., on *L. dioica*. D.  
*P. obscura* Schroet., on *Luzula sylvatica*. W.  
*P. graminis* Pers., on wheat and *Agropyron repens*. Oats. T.  
*P. lolii* Niels, II, III, on *Lolium perenne*, *Arrhenatherum avenaceum*, *Agrostis alba* and *Agropyron repens*. T., D., K.  
*P. sessilis* Schneid., II, III, on *Phalaris*. F.  
*P. dispersa* Er. et Henn., II, on *Avena pratensis* var. *longifolia*. D.  
\**P. holcina*, on *H. lanatus*. T.  
\**P. simplex* Er. et Henn., on barley. T.  
*P. poarum* Niels, OI, on *Tussilago*. T.  
*P. baryii* Wint., on *Brachypodium sylvaticum*. T., F.  
†*P. polygoni-convolvuli* DC., II, III, on *P. convolvulus*. T.  
\**P. celakovskyana* Bub., II, III, on *Galium cruciatum*. T.

## AGARICALES

- Amanita phalloides* (Vaill.) Fr.  
*A. muscaria* (L.) Fr.  
*A. rubescens* (Pers.) Fr.  
*Lepiota procera* (Scop.) Fr.  
*L. rhacodes* (Vitt.) Fr.  
\**L. nymphaeum* Kalchbr.  
*L. cristata* (A. et S.) Fr.  
*L. amianthina* (Scop.) Fr.  
*L. carcharias* (Pers.) Fr.  
*L. sistrata* Fr.  
*Armillaria mellea* (Vahl.) Fr.  
*Tricholoma rutilans* (Schaeff.) Fr.  
*T. imbricatum* Fr.  
*T. argyraceum* (Bull.) Fr.  
*T. panaeolum* Fr.  
*T. melaleucum* (Pers.) Fr.  
*T. sordidum* (Schum.) Fr.  
*Russula delicata* Fr.  
*R. nigricans* (Bull.) Fr.  
*R. ochroleuca* (Pers.) Fr.  
*R. fellea* Fr.  
*R. drimeia* Cke.  
*R. queletii* Fr.  
*R. emetica* (Schaeff.) Fr.  
*Mycena pura* (Pers.) Fr.  
*M. adonis* (Bull.) Fr.  
*M. nivea* Quéf.  
*M. galericulata* (Scop.) Fr.  
*M. polygramma* (Bull.) Fr.  
*M. inclinata* Fr.  
*M. ammoniaca* Fr.  
*M. metata* Fr.  
*M. vitilis* Fr.  
*M. sanguinolenta* (A. et S.) Fr.  
*M. galopus* (Pers.) Fr.  
*M. galopus* var. *alba* Fl. Dan.  
*M. epipterygia* (Scop.) Fr.  
*M. stylobates* (Pers.) Fr.  
*M. hiemalis* (Osbeck) Fr.  
*Collybia ambusta* Fr.  
*C. platyphylla* (Pers.) Fr.  
*C. maculata* (A. et S.) Fr.  
*C. butyracea* (Fr.) Bull.  
*C. rancida* (Fr.).  
*Marasmius oreades* (Bolt.) Fr.  
*M. peronatus* (Bolt.) Fr.  
*M. harioolorum* (DC.) Quéf.  
*M. impudicus* Fr.  
*M. dryophilus* (Bull.) Karst.  
*Androsaceus androsaceus* (Linn.) Pat.  
*Lactarius turpis* (Weinm.) Fr.  
*L. blennius* Fr.  
*L. pyrogalus* (Bull.) Fr.  
*L. deliciosus* (Linn.) Fr.  
*L. quietus* Fr.  
*L. rufus* (Scop.) Fr.  
*L. subdulcis* (Pers.) Fr.  
*Hygrophorus eburneus* (Bull.) Fr.  
*H. hypothecus* Fr.  
*H. pratensis* (Pers.) Fr.  
*H. virgineus* (Wulf.) Fr.  
*H. niveus* (Scop.) Fr.  
*H. metapodius* Fr.  
*H. laetus* (Pers.) Fr.  
*H. ceraceus* (Wulf.) Fr.  
*H. coccineus* (Schaeff.) Fr.  
*H. puniceus* Fr.  
*H. nigrescens* Quéf.  
*H. intermedius* Pass.  
*H. conicus* (Scop.) Fr.  
*H. chlorophanus* Fr.  
*H. psittacinus* (Schaeff.) Fr.  
*H. unguinosus* Fr.  
*Clitocybe nebularis* (Batsch.) Fr.  
*C. aurantiaca* (Wulf.) Studer.  
*C. candicans* (Pers.) Fr.  
*C. cartilaginea* (Bull. non Fr.) Bres.=  
*Tricholoma loricatum* Fr.  
*C. ditopus* Fr.  
*C. fragrans* (Sow.) Fr.  
*Laccaria laccata* (Scop.) B. et Br.  
*Onphalia hydrogramma* (Bull.) Fr.  
*O. umbellifera* (Linn.) Fr.  
*O. fibula* (Bull.) Fr.  
*Pleurotus aceroseus* Fr.  
*Pluteus cervinus* (Schaeff.) Fr.

## AGARICALES—continued

- Pluteus nanus* (Pers.) Fr.  
*Entoloma jubatum* Fr.  
*E. sericeum* Bull. Fr.  
*Nolanea stauropora* Bres. (= *N. pro-*  
*letaria* Boud. non. Fr.).  
*N. cetrata* Schroet.  
*N. papillata* Bres.  
*Leptonia lampropus* Fr.  
*L. sericella* (Fr.) Quél.  
*Clitopilus prunulus* (Scop.) Fr.  
*Pholiota togularis* (Bull.) Fr.  
*P. aurivella* (Batsch) Fr.  
*P. marginata* (Batsch) Fr.  
*Bolbitius vitellinus* (Pers.) Fr.  
*Inocybe pyriodora* (Pers.) Fr.  
*I. tomentosa* (Jungb.) Quél.  
*I. geophylla* (Sow.) Fr.  
<sup>+</sup>*I. decissa* var. *auricoma* (Batsh.) Fr.  
*I. godeyi* Gillet.  
*I. cincinnata* Fr.  
*Atrosporina lanuginosa* (Bull.) Schroet.  
*Hebeloma mesophaeum* Fr.  
*H. glutinosum* (Lindgr.) Fr.  
*H. crustuliniforme* (Bull.) Fr. var.  
*minus* Cke.  
*Naucoria escharoides* Fr.  
*Galera tenera* (Schaeff.) Fr.  
*G. antipus* (Lasch.) Fr.  
*G. hypnorum* (Shrank.) Fr.  
*Tubaria furfuracea* (Pers.) W. G.  
 Smith.  
*Flammula gummosa* (Lasch.) Fr.  
*F. carbonaria* Fr.  
*F. sapinea* Fr.  
*F. tricholoma* (A. et S.) Fr.  
*Cortinarius* (Phleg.) *infractus* (Pers.)  
 Fr.  
*C. (Myx.) elatior* Fr.  
*C. (Dermo.) anomalus* Fr.  
*C. (Dermo.) cinnabarinus* Fr.  
*C. (Dermo.) cinanmoneus* (Linn.) Fr.  
*C. (Hydro.) leucopus* (Bull.) Fr.  
*Psalliota augusta* Fr.  
*P. campestris* (Linn.) Fr.  
*P. villatica* (Broud.) Magn.  
*Stropharia aeruginosa* (Curt.) Fr.  
*S. albocyanea* (Desm.) Fr.  
*S. coronilla* (Bull.) Fr.  
*Anellaria separata* (Linn.) Karst.  
*Gomphidius roseus* (Fr.) Quél.  
*G. viscidus* (Linn.) Fr.  
*Hypholoma capnoides* Fr.  
*H. fasciculare* (Huds.) Fr.  
*H. velutinum* (Pers.) Fr.  
*H. hydrophilum* (Bull.) Fr.  
*Panaeolus sphinctrinus* Fr.  
<sup>†</sup>*P. acuminatus* (Fr.) Cke.  
*Psathyrella gracilis* Fr.  
*P. atomata* Fr.  
*P. disseminata* (Pers.) Fr.  
*Psathyra conopileia* Fr.  
*Psilocybe subericaea* Fr.  
*P. uda* (Pers.) Fr.  
*P. semilanceata* Fr.  
*P. foenicicii* (Pers.) Fr.  
*Coprinus atramentarius* (Bull.) Fr.  
*C. cinereus* (Schaeff.) Cke.  
*C. niveus* (Pers.) Fr.  
*C. micaceus* (Bull.) Fr.  
*C. plicatilis* (Curt.) Fr.  
*Nyctalis parasitica* (Bull.) Fr.  
*Craterellus cornucopioides* (Linn.) Fr.  
*Paxillus involutus* (Batsch) Fr.  
*Boletus luteus* (Linn.) Fr.  
*B. viscidus* (Linn.) Fr.  
*B. badius* Fr.  
*B. bovinus* (Linn.) Fr.  
*B. piperatus* (Bull.) Fr.  
*B. variegatus* (Swartz) Fr.  
*B. subtomentosus* (Linn.) Fr.  
*B. erythropus* (Pers.) Quél.  
*B. scaber* (Bull.) Fr.

## APHYLLOPHORALES

- Polyporus varius* Fr.  
*P. giganteus* (Pers.) Fr.  
*P. adustus* (Willd.) Fr.  
<sup>\*</sup>*P. stipticus* (Pers.) Fr.  
*Fomes ferruginosus* (Schrad.) Mass.  
*F. annosus* Fr.  
*Ganoderma applanatum* (Pers.) Pat.  
*Polystictus versicolor* (Linn.) Fr.  
*P. abietinus* (Dicks.) Fr.  
*Irpex obliquus* (Schrad.) Fr.  
*Lenzites betulina* (Linn.) Fr.  
*Daedalea biennis* (Bull.) Quél.  
*Merulius rufus* (Pers.) Fr.  
*Phlebia merismoides* Fr.  
*Fistulina hepatica* (Huds.) Fr.  
*Hydnum repandum* (Linn.) Fr.  
*H. auriscalpium* (Linn.) Fr.  
*Phylacteria terrestris* (Ehrenb.) Big.  
 et Guill.  
*Hypochnus ferrugineus* (Pers.) Fr.  
*H. fuscus* (Pers.) Fr.  
*Stereum rugosum* (Pers.) Fr.  
*S. hirsutum* (Willd.) Fr.  
*Hymenochaete rubiginosa* (Dicks.) Lév.  
*Corticium laeve* (Pers.) Quél.  
*C. sambuci* (Pers.) Fr.  
*Peniophora gigantea* (Fr.) Mass.  
*Clavaria cinerea* (Bull.) Fr.  
*C. corniculata* (Schaeff.) Fr.  
<sup>\*</sup>*C. umbrinella* Sacc.  
*C. inaequalis* Müll Quél.

## AURICULARIALES

- Auricularia auricula*—*Judae* (Linn.) Schroet.



## CALOCERALES

*Dacryomyces deliquescens* (Bull.) Duby.      *Calocera viscosa* (Per.) Fr.

## GASTEROMYCETALES

*Cynophallus caninus* (Fr.) Corda.      *Bovista nigrescens* Pers.  
*Lycoperdon umbrinum* Pers.      *Scleroderma aurantium* Pers.  
*L. perlatum* Pers.      *S. verrucosum* (Vaill.) Pers.  
*L. pyriforme* (Schaeff.) Pers.      *S. ceps* (Vaill.) Pers. (det. Kew).

## FUNGI IMPERFECTI

## PHOMATALES

*Darlucula filum* (Bivon.) Cast.

## MELANCONIALES

*Steganosporium pyriforme* Corda on *Acer pseudoplatanus*. T. and F.

## MONILIALES

*Monilia aurea* Auct., on rotten *†Menispora tortuosa* Corda, on *Fraxinus*  
*Fagus* wood. T. bark. T.  
 $\dagger$ *Oospora candidula* Sacc., on *Nectria*  $\dagger$ *Stachylidium bicolor* Link ex Fr., on  
*cinnabarina*, on *Ulmus*. F. *Heracleum* stems. F., and *Petasites*  
*Fusidium viride* Grove, on *Petasites* petioles. D.  
*Botryosporium pulchrum* Corda, on *Cladosporium herbarum* (Pers.) Link  
*Urtica* stems. T. and K. ex Fr., on *Lolium*.  
 $\dagger$ *Gliocladium penicillioides* Corda, on *Polythrincium trifolii* Kunze ex Fr.  
*Stereum*. T. *Helminthosporium velutinum* Link ex  
*Fr.* on ? *Acer*. T.  
*Botrytis* sp., on *Petasites* petioles. F. \**H. apiculatum* Corda, on *Crataegus*  
[M. and G., incorrectly as *Pachybasium tilletii*.] and other wood. T. and K.  
 $\dagger$ *H. fusisporium* Berk., on *Corylus*. F.  
*Sepedonium chrysospermum* (Bull.) Fr. \**Dendryphium rhopaloides* (Fresen.)  
*Ovularia bistortae* (Fckl.) Sacc., on Berl., on Umbell., D., and on  
*Rumex obtusifolius*. Sycamore stump. T. [M. and G.,  
*Trichothecium roseum* Link sub *Helminthosporium*.]  
\**Mastigosporium album* Preuss, on  $\dagger$ *Pachnocybe clavulata* Grove., on old  
*Dactylis glomeratus*. wood. K.  
*Torula herbarum* Link ex Fr., on stems \**Epicoccum purpurascens* Ehrenb. ex  
of *Urtica*, *Heracleum*, and on wood Wallr., on conifer trunk. D.  
and bark of *Sambucus*. T., K., F.  $\dagger$ *Coniothecium betulinum* Corda, on  
*Torula ovalispora* Berk., on *Fraxinus* *Betula* twigs.  
wood. T. \**Fusarium heterosporum* Nees., on *Poa*  
*Periconia pycnospora* Fresen., on *Hera-* *annua* and *Arrhenatherum avenaceum*.  
*cleum*. T. W.

## REVIEWS AND BOOK NOTICES

A Check List of British Insects, by George Sidney Kloet, F.Z.S., F.R.E.S., M.S.B.E. and Walter Douglas Hincks, M.P.S., F.R.S.E., M.S.B.E., with a Preface by N. D. Riley, 1945, pp. lx+484+xii; Buncle & Co., Arbroath, £2 10s. For some years we have been looking forward to the issue of this work, and now that it is in our hands we congratulate the authors on the completion of their task. In their Introduction we are given some idea of the obstacles and hindrances which were added by war conditions to the many vexing problems inherent to the work itself. That these did not damp their enthusiasm is evidence of that dogged determination which deserves, but does not always meet with, success. In this case success has crowned their efforts. Future generations, ignorant, we hope, of the destruction caused by modern warfare, will read with sympathy of the loss by enemy action of Mr. Kloet's library and the salvaging of the original manuscript, charred, it is true, but legible enough to enable them to try again.

Nomenclature has always been a thorny subject, and it would seem that now we have an international commission changes multiply rather than diminish. With many of these changes I disagree profoundly, but it was the duty of the authors, whatever their private views may be, to register such changed nomenclature as for the moment is in the ascendant. This they have done, and, so far

as I am able to judge, done well. It is evident that every care has been taken to ensure accuracy.

The title-page bears the date 1945, and no doubt some copies were issued before the end of last year, a fitting finale to Mr. Hinck's year of office as President of the Yorkshire Naturalists' Union. My copy was a Valentine, as it reached me on the morning of February 14th. The authors may justly claim that their work gives an up-to-date comprehensive view of the Entomological Fauna of the British Isles, and that it will prove to be an indispensable tool to every working entomologist.

Comparing the present work with Stephens' Catalogue, which was issued in parts from 1827 to 1829 when it appeared as a bulky volume (2 vols. in one) the present list contains almost exactly double the number of species recorded: Stephens 10,012, K. and H. 20,023. The greatest increase has been in the orders Hymenoptera and Diptera, which are here shown to have the greatest number of species, nearly 57 per cent. of the whole; and this reflects the intensive research of workers all over the country, amongst whom are several members of the Entomological Section of our Union. The present work is not planned on the same expansive scale as was Stephens'; synonyms, except in cases where they are vitally necessary, are omitted, and the same remark applies to indications where a good figure may be found, occurrences in the London area, etc. Instead a series of signs are given which add materially to the value of the work; by their means useful information is given without increasing the number of lines. The result is that the maximum of information is given in the minimum of space.

It is not usual to find illustrations in a work of this kind, but the authors have thought fit to give one in the shape of facsimiles of the title page and preface of the earliest *Check List of British Insects* published in 1770 at Warrington. By doing so they have drawn attention to a work of considerable importance which must be known to very few of those immediately concerned. It was evidently a great advance on Berkenhout's *Outlines of the Natural History of Great Britain*, of which the first volume devoted to the Animal Kingdom was published in 1769, only a year earlier, for the latter records only 572 Insects against 1,004 in Forster's List. Of these 572, at least 32 almost certainly would not occur at Warrington; it follows that 464 or 46 per cent. of the whole were entirely new records. This is a remarkable achievement, the more so when it is remembered that it was the result of three years collecting in a limited area, viz. Warrington and the surrounding district. Thirty-nine of Berkenhout's species were Arachnids and Crustaceans, and as may be gathered from Forster's preface that he included the whole of Berkenhout's species in his list, specifying such as he had not met with, the Arachnids and Crustaceans must have exceeded the biblical 'few' (p. xiii) 'i.e. eight.'

The type is clear and the general arrangement excellent. Even the very full Index which is in small type should not prove trying to old eyes. Nothing seems to have been overlooked, for, at the end of the volume, 12 pages of blank paper have been bound in for notes. This is a most useful addition and sets an example which should be followed by all who bring out works intended for daily use. It would have been an improvement if the paper had been ruled, and the binding case of a stouter kind. Especial praise is due to the proof-reader. His task has been a most exacting one, and there must be very few slips that have passed into print. I have noticed but one, to which must be added one name omitted from the Index. Any opinion given so soon after publication must be more or less of a superficial character; but it is safe to say that this volume is requisite for every working entomologist; its real and full value will be appreciated only by constant and regular use.—E. G. BAYFORD.

**London's Natural History**, by R. S. R. Fitter. Pp. xii+282 with 52 colour photographs by Eric Hosking and others, 41 black and white photographs and 12 maps and diagrams. Collins, 16/-. This book is one of the volumes of *The New Naturalist*, a series now being brought out by Messrs. Collins with the object of presenting a survey of British Natural History. The Editors of this ambitious venture are James Fisher, John Gilmour, Julian Huxley and L. Dudley Stamp, with Eric Hosking as Photographic Editor. The reader will naturally expect to find a high standard of accuracy in writing and in illustration, and the most critical naturalist will not be disappointed. Of the first four titles, the volume under review appears to be the most ambitious in respect of the field

surveyed by the author. It would be difficult to imagine a better choice than that of Mr. Fitter for this complicated piece of work. When the reader discovers that the area covered is that within a radius of twenty miles of St. Paul's, over twelve hundred square miles, he will appreciate the magnitude of the task. This is the area covered by the London Natural History Society, whose journal, *The London Naturalist*, is edited by Mr. Fitter. It would be impossible in the limits of a review to do complete justice to this very fine work, but it may be indicated that the author's general plan is to review fairly fully the kaleidoscopic changes which have taken place in the nature and distribution of the flora and fauna of an area which has been subjected to the enormous and ever-increasing activities of man for a period of over 2,000 years. It must not be supposed that the record is one of monotonous destruction of habitats and species working up to a not very distant complete extinction of wild life. On the contrary the London naturalist has much to be thankful for. Many of man's operations actually favour the preservation of certain animals and plants. The absence of poachers and bird-nesting boys in London parks has made veritable sanctuaries of parts of Hyde Park, Hampstead Heath, Richmond Park, Kew Gardens, etc., etc. In the blitzed area adjacent to St. Paul's the rare black-redstart has nested and reared its young for several years. Mr. Fitter's chapter on this fascinating episode should be read by all ornithologists. The many sewage farms and reservoirs provide perfect hunting and resting sites for large numbers of birds. On December 18th, 1937, a census of waterfowl was taken in the London area when all stretches of water were placed under review. Over 6,000 ducks (excluding mallard), great-crested grebes and coot were counted. The botanist interested in aliens can find in the London area abundant material for study. London's vast foreign trade has meant the involuntary importation of a large number of 'foreigners' both plant and animal, the former arriving as seeds. Among animals arriving *via* the Port of London are rats and mice and a host of insects, spiders and other small fry, many of which survive to breed in this country. *London's Natural History* is a book which should be read by all naturalists. It sets a very high standard for monographs of a similar kind which might well be written about hundreds of areas of Great Britain. The value and attraction of the book are much enhanced by the many fine colour and black and white photographs which mark a most distinct advance in book illustration, while the maps and diagrams give lucidity to the text.

**Plant-hunting in China**, by E. H. M. Cox, pp. 230, with 24 illustrations and coloured frontispiece; Collins, 12/6. This book records the history of botanical explorations in China with special reference to their contributions to horticulture. The source of the florists' Chrysanthemum and centre *par excellence* of Primulas and Rhododendrons, to China also we owe many of the finest species of Liliium, Berberis, Gentiana, Meconopsis, Nomocharis, Camellia, Viburnum and other garden favourites. Few if any areas in the world can boast of a flora so supremely rich in species while as a source of choice shrubs and flowers hardy in the gardens of this and other north temperate regions, the mountains of the west and south-west are quite without rival. For a long time, however, all plants sent back to England were obtained from Chinese gardens or the country in the immediate vicinity of the few treaty ports open for trade, and not until the cession of Hong Kong in 1842, did it become possible for collectors to extend their range of activity. Robert Fortune was the first professional collector on the grand scale to exploit the horticultural riches of the country. Even then political causes prevented deep penetration of the country, and only since 1860 have the remoter parts of Western China and the Tibetan marches, the mountains of Yunnan and the Burmese and Assamese borderlands with their well-nigh inexhaustible floral riches been successively explored by such celebrated plant collectors as E. H. Wilson, George Forrest, Reginald Farrer and Kingdon Ward. Gardeners owe a great debt to these and other men for the discovery and introduction of so many of our most beautiful garden plants. In this story of their travels, by one who was himself a companion of Farrer's on his last journey, the history of plant collecting in China is presented as a chronological story in which the reader may learn much of the country and the conditions in which so many of our garden plants grow wild. These acquire a new interest when seen against such a background of strenuous endeavour in country as botanically entrancing as it is geographically remote and difficult of access. There are maps to enable us to follow itineraries and the photographs of plants and scenery are uniformly excellent.



**The Swallow**, by **Eric Hosking** and **Cyril Newberry**. Pp. 60 with 28 illustrations and two maps. Collins, 7/6. This delightful little book tells all that is known about the bird which the veriest ignoramus recognises as a migrant. The authors, having young people and beginners in mind, carefully go into the differences between the swallow, house-martin and sand-martin and have something to say of the swift, which the non-ornithologist so readily but incorrectly includes in the family. The breeding habits of all the species are described but, as its title indicates, the book is mainly about the swallow. Omitting verbosity and padding of all kinds the authors have managed to give in considerable detail such important matters as the kinds of insect food brought to the nestling by the parent birds, the frequency of the feeding, nest sanitation, and the first attempts of the youngsters to fly. The facts of migration are stated clearly and the book is copiously illustrated. All the photographs are really good, but special mention must be made of Mr. John Barlee's two pictures of a swallow in flight and a swift in flight. The youngster who studies these carefully will make his future identifications with greater confidence.

**Edible and Poisonous Fungi**. Ministry of Agriculture and Fisheries, Bulletin No. 23, pp. 35, with 27 coloured plates; H.M. Stationery Office, 3/6. Originally published thirty-five years ago, this book was one of the first non-technical and popular guides to the identification of the commoner species of edible and poisonous fungi to be issued in the country. The stocks of the fifth edition having been destroyed by enemy action, a new edition has now been published with the text completely revised and rewritten by Miss E. M. Wakefield. A short introduction deals with the nature, structure and classification of the larger fungi, their use as food and best methods of cooking. Eighteen of the most esteemed edible species and nine poisonous species are illustrated from paintings by Miss Wakefield. The accompanying descriptions are very clearly worded and the information given includes details as to habitat, time of appearance and hints on the best way of preparing the edible species for the table.

**Diseases of Bees**. Ministry of Agriculture and Fisheries, Bulletin No. 100. H.M. Stationery Office, pp. 25, price 9d. net. This bulletin on some of the important diseases which affect the honey bee, is divided into two sections: (a) brood diseases and (b) diseases of adult bees. A large part of the section on brood diseases deals, as one would expect, with Foul Brood. Some excellent plates are shown which exhibit the characteristics of infected brood comb. One of the photographs demonstrates the correct method of examining suspected comb for the dry scales which adhere to the cell walls which have contained larvæ killed by American Foul Brood. There is some really practical advice for controlling the spread of Foul Brood diseases and for the destruction of infected stocks and the disinfection of hives and appliances so as to render them safe for further use. Other brood diseases, their symptoms and treatment are briefly discussed and among these are Chalk Brood and Chilled Brood. Of the diseases which attack adult bees, by far the most important is Acarine, caused by the parasitic mite *Acarapis woodi* (Rennie) which invades the thoracic tracheal system of adult worker, drone or queen bee. Acarine disease is probably very widely spread but fortunately, due to the pioneer work done by R. W. Frow some years ago, it is both curable and preventable by treatment of the colony with nitrobenzene as a curative agent and methyl salicylate as a prophylactic. Most beekeepers treat all their colonies once yearly by the Frow method and the book gives some useful hints on the method of treatment. Bee Paralysis was once thought to be one disease, but as a result of recent research at Rothamsted, is now divided into not less than nine types. The recognition and treatment of each type is dealt with in detail. Other diseases of adult bees, of less importance, are mentioned briefly. There are also some useful hints to fruit growers on the spraying of trees with poisonous chemical compounds which, used indiscriminately, kill many bees. It is, however, disappointing to note that there is no mention in this section of the use of D.D.T. as an insecticide and its possible effects on our pollinating insects. This booklet is an extension of Bulletin No. 9 (Bee-keeping) revised by the Bee Department of Rothamsted Experimental Station. One is pleased to note some practical hints on how to pack and send specimen combs, bees, etc., to them for examination.



## In Memoriam

FRANCIS ERIC MILSOM, B.Sc. (Lond.).  
(1886-1945)

RECENTLY the Union has had to record great loss in the ranks of northern naturalists, and it is with sincere regret that we now record the death of Francis Eric Milsom. This took place on the evening of the 5th December, 1945, at his residence High Cross, Kirkburton, near Huddersfield, in his sixtieth year. He was born on the 24th May, 1886, at Bowes Park, London. During his scholastic days he displayed



great aptitude in his studies the proficiency of which was evidenced by his successes in the Local Cambridge Examinations in which he took First Class Honours in Theoretical, Organic and Inorganic Chemistry. As an external candidate he obtained the London degree of Bachelor of Science in 1908. He was registered as a Chemist and Druggist and became a member of the Pharmaceutical Society of Great Britain on the 3rd May, 1911. Prior to his coming to Yorkshire he served as an experimental chemist with two firms of manufacturing chemists in London. He came to Huddersfield in November, 1917, where to the time of his death he was in the employment of the British Dyestuffs Corporation, Ltd., continuing after its merger with the Imperial Chemical Industries, Ltd., a period of twenty-eight years.

Milsom had an excellent knowledge of flowering plants, but his pre-eminent and outstanding study was of the bryophytes, of hepatics in particular, of which he had a most wide knowledge. He became associated with the British Bryological Society in 1923. His abilities soon proved their worth as in 1934 he was made referee for British and European hepatics and continued in that capacity to the date of his death. From 1925 to 1933 he served as distributor of hepatics to the members of the British Bryological Society. He was enthusiastic in his attendance at the excursions of the society and helped in the arrangements for the excursions

to Ingleton in 1926 and 1934. At the time of his death he was President elect of the society and he bequeathed to it his collection of bryophytes.

Milsom became a member of the Yorkshire Naturalists' Union in 1918, and very shortly afterwards was elected by the Bryological Committee as recorder for that section as well as its representative on the Executive Committee and he was holding both offices at the time of his death. His yearly reports were always concise, sound and painstaking. In addition he made valuable contributions to *The Naturalist* concerning Yorkshire bryophytes. He also gave much assistance in the compilation of the supplementary records of the Mosses, Liverworts and Lichens of the county shortly to be published by the Y.N.U. He was always willing to help fellow students in identification of their specimens and he was never averse to lecture upon his favourite studies to societies in the West Riding. Such lectures were characteristic of the man and his powers of observation and energy. The writer was in constant touch with him in his work in the field, and can speak of his worth as a friend, and of the kindly geniality of his nature. He was greatly interested in choral music and made skilful use of his tenor voice for many years as a member of the Huddersfield Choral Society, whilst prior to coming north he was a member of the famous Alexander Choir, London. He was interred in the graveyard attached to the parish church of Kirkburton on the 10th December, 1945. Amongst the many who attended the funeral being representatives from the departments at the I.C.I. and fellow students. The Y.N.U. was represented by the writer.—W. E. L. W.

Mr. Wattam has given an account of F. E. Milsom's connection with the British Bryological Society, but I wish to say how very much he was appreciated and valued by the members of that society.

At the time of his death he had been for some time the one amongst us who had the greatest knowledge of British Hepatics and his loss to us on that account is very great. He had an excellent acquaintance with the mosses also. His worth to the society was recognised at our meeting last September by his appointment as Vice-President, so that in two years' time he would have become President.

We had hoped to see him at our next meeting at Easter and we shall greatly miss his genial and kindly presence and his useful help in our discussions and arrangements.—A. T.

### NATURALIST CLUBS IN THE MIDDLE EAST

ENGLISHMEN have usually taken their own habits and pursuits with them to whatever part of the globe they have penetrated. Naturalists who have found themselves during the war in strange and unexpected places have had a tremendous advantage over devotees of films and other provided amusements. What was often boredom to others became opportunity to the naturalists. Much of the ornithological knowledge we possess of many remote parts of the earth is due to activities by members of the British Army and Administrative Staffs in peace time. In war-time, in the Middle East, Naturalist Clubs have been formed, open to anyone interested, at Jerusalem, Haifa, Bagdad, Damascus and G.H.Q., Cairo. Small parties have explored the neighbourhoods; field meetings have been attended by various ranks, and periodical bulletins have been prepared, duplicated and circulated.

The Jerusalem Club had the advantage of the keenness and journalistic ability of Capt. Eric Hardy, well known for his work with the Merseyside Naturalists' Association. The Weekly Bulletins consist mainly of field notes covering botanical, mammalian and ornithological features of the areas visited. Although the aim has been to help anyone interested in any form of wild life in Palestine, the Bulletins should form the basis of good papers for scientific journals.

The migration route along the coastal belt brought a large number of species of various types. Specimens were collected as well as field notes. 'Devastating losses' appear to have been caused to Palestinian wild life during the war by indiscriminate shooting; and a scheme for conserving duck at Lake Huleh has been necessitated. That side of the picture is somewhat unpleasant. At Bagdad a club known as the Paiforce Naturalists' Club was inspired by that keen all-rounder, Mr. Sidney Jackson, of the Bradford Museum, who returned home recently. Passage migrants were naturally less numerous than along the coastal belt, but many birds were common to both countries.

R. C.

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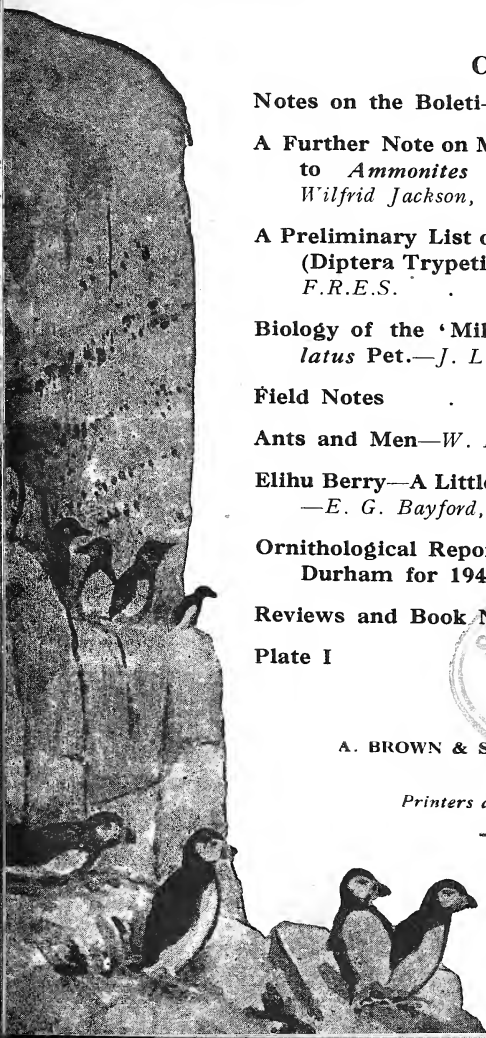
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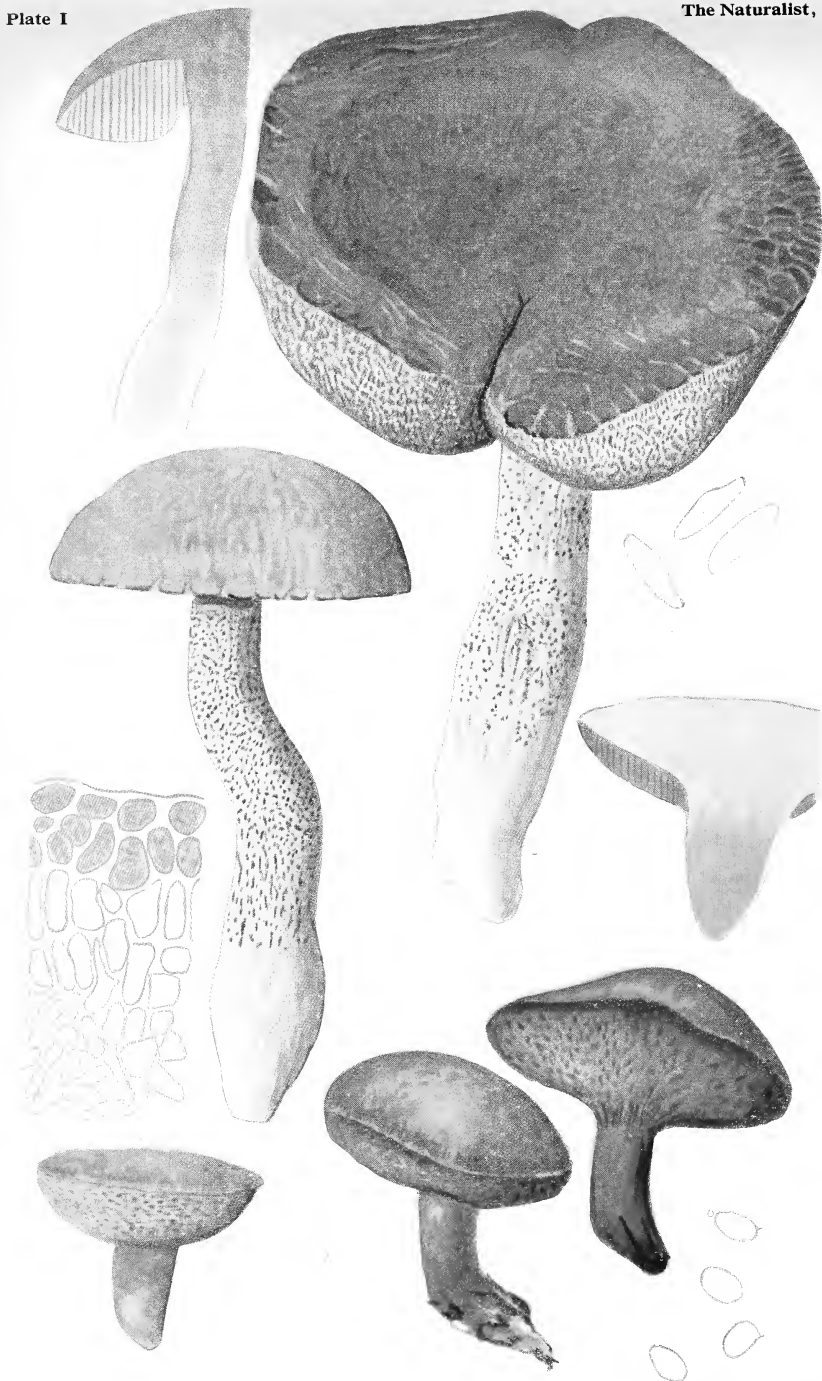
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UPPER FIG.—*Boletus Carpini* (R. Schulz.) Pearson, by Dr. R. W. G. Dennis from specimens collected near Hindhead, Surrey. The colour is rather paler than in some other specimens, but brings out the character of the pileus very well.

LOWER FIG.—*Boletus rubinus* W. G. Smith, by Miss E. M. Wakefield. Two of the specimens were from the Royal Botanic Gardens, Kew, Surrey, and one from Wiltshire showing how the brilliant colour may fade to a dull pink.

Spores of both species  $\times 750$ . Section of cuticle of *Boletus Carpini*  $\times 500$  shewing layer of the more or less spherical dark coloured cells approx.  $10\mu$  dia. and 2 or 3 cells thick, resting on compact colourless tissue which passes below into the spongy tissue of the pileus flesh.



# NOTES ON THE BOLETI

## With Short Monograph and Key

A. A. PEARSON, F.L.S.

In some classifications of the fungi, the Boleti are placed among the Agaricales, although they have tubes instead of gills on which the basidia and spores are produced. In the system established by Elias Fries, the genus *Boletus* was included among the polypores for obvious reasons; indeed that seemed its natural position. Subsequent authors came to the conclusion that the growth of the Boleti, starting from the size of a pin's head to maturity, corresponded too closely to the agarics to retain their place among the polypores. They assumed that in its early stages a *Boletus* possessed a universal veil and in some cases perhaps a partial veil which persisted as a ring on the stem. To use the modern term, it was thought that the Boleti were angiocarpous, which means that in the first stages of growth the spore-producing tissue was inside a protective covering as contrasted with the other types of fungi with pores, spines, or a flat surface, where the hymenium was gymnocarpous, that is to say, where the spore-producing tissue was naked and without any protective cover. In this case the growth of the hymenium was not limited but could continue to spread laterally.

As a matter of fact, in the more recent researches, some of these assumptions have been upset. For instance, we now know that the Boleti are, in the very early stages, gymnocarpous. The protective veil is not there at first, but sometimes appears later, growing from the margin inwards and forming much the same sort of ring as if it had had a veil from the beginning.

However, that has made little difference to the view that the fleshy Boleti are nearer to the agarics than to the polypores. Indeed, many agarics also start with a gymnocarpous or naked hymenium. Later authors have cut the Gordian knot by cutting out the Boleti from both agarics and polypores, placing them in a separate order, the Boletales. It is true that some would like to include a few agarics in this order which appear to link up closely with the Boleti. Most species of *Paxillus* have gills which, like the tubes of most species of *Boletus*, easily separate from the pileus and also have parts of the gills, especially near the stem, which anastomose to form a honeycomb, almost a pore-like structure. This is more evident in some species than others. The most striking instance is in what we have called *Paxillus paradoxus*, where all the gills are joined up by veins: If we transfer this to a separate genus and adopt the modern epithets, *Phylloporus rhodoxanthus*, we can place it in the Boletales where it belongs, since it is nearly akin to *Boletus chrysenteron*, and what is left of the Paxilli can safely be left among the agarics.

Mycologists, like other naturalists, amuse themselves in trying to produce complete phylogenetic tables, tracing the evolutionary changes of the fungi from the beginning of time. They argue that the tubes of a *Boletus* have evolved from the veined or honeycomb-like gills we meet with in *Paxillus*. It may be so, but I always feel that such theories are too speculative to be taken very seriously. Excepting *Paxillus paradoxus*, which is not a *Paxillus* at all, there is no species of *Paxillus*, so far as I know, with what may be called the characteristic fusiform spore of a *Boletus*; and not all Boleti have this spore. There are also many other agarics with gills that easily separate from the pileus such as *Tricholoma nudum* and its allies which French authors place in a separate genus, *Rhodopaxillus*. We find the same thing in *Clitopilus prunulus*, and so on. *Gomphidius* also links up with the Boleti, and all the species have the boletoid spindle-shaped spore, but of a colour that does not compare with any species of *Boletus*.

We must, however, remember that the forces of nature in different organisms may take the same direction quite independently without their being any parental relationship. All we need agree about is that the aim of any classification is to place what are apparently nearly related genera together. The fact of the matter is that these troublesome fungi refuse to behave themselves in a logical manner and a completely logical system is not possible. As our old friend, Carleton Rea, is fond of saying, they will not play the game. I am afraid that if a completely logical system is ever divided, it will be unworkable to all but a few specialists.

But I must not weary you with discussions of this sort. Most of us are interested in species and we all know what a *Boletus* looks like. When it comes to naming one, we may not feel so confident, and our English books are not so helpful

as they might be. Boleti are apt to undergo many changes during their growth, and often look quite different in the adult stage compared with what they were when first appearing above ground.

The diagnostic characters of a *Boletus* are much the same as in the agarics : size, shape, colour, surface, viscosity, ornamentation of stem, colour of spore powder, flesh reaction when exposed to the air, and habitat. These make up the usual ensemble of features which we look for in the field. Under the microscope we examine the spores for shape or size ; the cystidia which may be ventricose, cylindrical or club-shaped, hyaline or golden coloured ; the cellular tissue of the pileus surface which usually consists of narrow horizontal hyphae but sometimes has wider and shorter cells, cylindrical, sack-shaped, or globose. Chemical reactions also find their place in the diagnosis and doubtless will be more used in the future.

Bacterio-static substances which inhibit the growth of some pathogenic bacteria, though hardly likely to play an important part in systematic work, do not appear to be present in most Boleti. Mr. Swanton and I sent the juices of 35 species of Boleti to Oxford for bacterio-static tests ; all were negative except *Boletus Satanas*.

That brings me to the edible qualities of the Boleti, some of which are well known and appreciated by gastronomists. With the sole exception of *Boletus Satanas*, cases of poisoning of which have, I think, been fully authenticated, none of the Boleti are poisonous. *Boletus felleus* is bitter as its name implies ; a few others, including *Gyroporus castaneus*, *Boletus calopus* and *albidus*, are also rather bitter when cooked, and *B. piperatus* is too peppery for most people ; but I do not think any of these has done much harm except to spoil a few dishes which hungry mycophagists had looked forward to with relish. Most of the rest are esculents, some not particularly good, others excellent, including many that turn blue, which in the older books have been described as dangerous. Perhaps, however, it is as well to retain the note of warning until you have learned to distinguish *Satanas* from its innocent allies. When cooking Boleti, it is perhaps better to take away the tubes which in some species spoil the dish for some people.

One point of interest must have a passing mention. Many Boleti form mycorrhiza ; that is to say the mycelium wraps itself round the tender rootlets of forest trees. While taking its nourishment in this parasitic manner, the *Boletus* is said to provide protection to the tender growing rootlet, especially in dry weather, and, indeed, to be essential to the healthy growth of many trees. Certain associations of trees and fungus are known to all field mycologists : larch with *Boletus elegans* and *viscidus* ; pine with *B. bovinus*, *luteus*, *variegatus* and others ; birch with *B. scaber* and *versipellis*. These and others have their useful part to play in the forest economy ; how much it still remains to discover.

Among the Boletales there are a few that are obviously distinct from the ordinary run of Boleti. I have already mentioned *Paxillus paradoxus* Kalch., which is not definitely an agaric nor a *Boletus*, but its general aspect and also its microscopic features so closely resemble what is found in the Boleti, that it will not be out of place among the Boletales under the name generally accepted of *Phylloporus rhodoxanthus* (Schw.) Bres. This specific epithet dates from 1822, so it easily has priority over Kalchbrenner's name published in 1873. It must not be confused with *Boletus rhodoxanthus* Kromb., which is the same as *B. purpureus* Fr.

Then we have the genus *Gyrodon*, with gyrose plicate hymenium. The only fully authenticated species seems to be *Gyrodon lividus* (Bull.) Opat., which grows under alders. It has not been recorded for Britain, but there are three other records of *Gyrodon* which I suspect to be forms of Boleti with the tubes not fully developed. These immature forms with wrinkled or labyrinthine hymenium are not uncommon and an easy trap for the unwary. We must all pay a little more attention to the alder woods in the hope of finding the genuine *Gyrodon lividus* which I have inserted among the British species on the assumption that it has been called by one of the names in our books : *G. sistotrema*, which is considered as a synonym of *lividus*.

Another rare species, *Boletinus cavipes* (Opat.) Kalchbr., has rather large decurrent honeycomb-like pores, the veil or pseudo-veil sheathing the stem and terminating in a white ring. It grows under larches and both in colour and habitat is not unlike *Boletus elegans*. It has been recorded for Britain but not for a long time.

A species that can be recognised at once is *Strobilomyces strobilaceus* (Scop.) Berk. The tubes are more normal, but in other respects it differs widely from

other Boleti since it has large brownish-black scales on pileus and stem and the purplish black spores are globose and coarsely reticulated.

Coming to the more normal types, we find some of these are put into separate genera. The agarics were long since split up on the basis of spore colour, and attempts to do the same for the Boleti have been tried. I have already mentioned *felleus*, which has pinkish spores (vinaceous fawn of Ridgway) and often masquerades under the title of *Tylophilus felleus*, though it is so closely allied to *Boletus edulis* that it can easily be mistaken for it by the careless collector for the pot; he will find it nasty enough to be more careful in future.

The uncommon *Boletus porphyrosporus*, with its purplish-brown spores, was transferred by Bataille into the genus *Phaeoporus*, but as this had already been used for another genus of polypores, it had to be withdrawn, so the valid name is *Porphyrellus porphyrosporus* (Fr.) Gilbert.

Then we have Boleti with pale lemon-yellow spore powder, which are usually placed in the genus *Gyroporus* Zúñet. There may be more justification for adopting this, since the two European species have rather tougher flesh than is usual in Boleti. Those of us who receive dirty masses of putrescence in parcels sent by post know what that means.

The genera I have mentioned only cover a few species. What about the rest? Those who follow the modern French school of thought split them up into four further genera, but not on the basis of spore colour. Attempts have been made to do this, but not very successfully. Not that there is a great variation of colour. The most frequent is an olive brown (medal bronze of Ridgway), but mixed up with closely related species are some with spore powders of different hues: clay colour, snuff brown, and other browns. To get spores in mass, a good deposit is necessary. I always scrape up the powder with a knife, put it into a small packet and compare with a colour chart. Boleti do not always shed spores in profusion; they are rather capricious in this respect, but for most species I have been successful. If we attempt to make genera to coincide with these spore colours we find many clearly related species going into genera that hardly link up in a satisfactory way.

Much the same thing happens if we take spore shape as the basis for new genera. The most frequent—perhaps we may say the typical—shape of a *Boletus* spore is fusiform measuring about  $12 \times 5\mu$ , but several species have elliptical spores, some quite small.

The only practical method, if we are to avoid a purely artificial classification, is to place those species possessing a certain number of features in common, or with a certain family likeness—not too obvious in some cases—into separate genera or under the same sectional heading. Some anomalies occur and one or two species can be linked up with more than one section, but on the whole the four divisions are fairly clean cut and you can please yourselves whether to adopt them as separate genera or merely as sections or groups of the genus *Boletus*.

The epithets to be applied to the various species are beset with difficulties. Most of the sorting out has been done by two modern authors; a good deal by E. J. Gilbert in his useful book *Les Bolets* (1931). Gilbert is rather impatient with the rules of botanical nomenclature and some of his names cannot be accepted. A more ambitious but unfinished work is that of Franz Kallenbach, who in 1925 began the publication in parts of his monograph of the Boleti, with excellent coloured plates. The German text is in great detail, but many of his names, too, are not acceptable. It is indeed sometimes difficult to decide which name is valid according to the rules, and I can hardly hope that all those I have chosen will be found to be satisfactory to everyone. But they do represent a species defined by a given author and it is not of great importance if later some other name shall be proved to have priority. A few familiar names disappear, usually because they have been applied to so many different Boleti that their continued use is a source of confusion. The number of British species left in the list is 47 as contrasted with 70 in Carleton Rea's *British Basidiomycetae*, without counting varieties. Those excluded are either synonyms or unauthenticated species.

We have one species which has not been recorded outside England. I refer to *Boletus rubinus*, first found by Worthington G. Smith in Bedfordshire in 1866. Since then it has turned up from time to time. Specimens were sent to me from Wiltshire early in September, 1943, where it was growing in fairly large numbers under oak. It was also gathered in Kew Gardens, when Miss Wakefield took the opportunity of painting it, and I am glad to be able to include it on the coloured

plate attached to this paper. Most specimens are small, but those figured by W. G. Smith in the *Journal of Botany* (1868) are up to 6 cm. wide. It is a very pretty *Boletus* adorned with a brilliant carmine colour which soon fades. From its general appearance it appears to be allied to the *Xerocomus* group, but has several aberrant features that make it difficult to place. It has small elliptical spores while all the other species in the group possess the long typical fusoid spore. A continental species, *Boletus amarellus* Quélet, not yet found in Britain, appears to be closely allied to it and this is placed in the *Ixocomus* section next to *piperatus*. There is also an American species, *Boletus rubinellus* Peck, first recorded in 1880, and another *rubritubifer* Kauffm. (1914), probably the same as Peck's species, but both have fusiform spores and must be considered as distinct. *Boletus rubinus*, then, is the only species confined to this country, but there are about a dozen European species not found here, and in most cases not likely to appear since they require a warmer climate. Two species and a variety have been recently added to our records, *Boletus Carpini* (R. Schulz) Pearson, *B. scaber* var. *coloripes* Singer, and *B. cramesinus* Secr. I am dealing with these in more detail in a forthcoming paper in the *Transactions of the British Mycological Society*, but am delighted to be able to include the characteristic illustration of *B. Carpini* by Dr. Dennis.

In other parts of the world Boleti are found which do not occur in Europe. In the *North American Flora* 75 species are described only 12 of which are known in Europe. It still remains to be seen how rich in Boleti the Southern States are. If the recorded numbers give a correct impression, Boleti are not common in warm climates. Only 15 species are recorded in India, which include five species of *Strobilomyces*. From Ceylon five have been listed and four from the Phillipines. But these lists may not give a correct picture of the relative frequency of the fleshy fungi which have not been intensively studied in tropical countries. Only specimens that can easily be preserved like the tough polypores and others are sent to Europe for identification; the softer fungi must be studied on the spot. They decay very quickly in hot weather even in England and their life must be very short in the hot damp forests and jungle of the tropics. Very little is really known about the tropical fleshy fungi and a vast field is open to future mycologists.

The following key to the British species must be used with discretion. There are many pitfalls in the making of a key to such a protean genus as *Boletus*. An attempt has been made to avoid these by a few cross references. The characters refer to fresh specimens, and it must be remembered that all specimens gathered in the field are not fresh and a viscid pileus may be dry when examined.

The few abbreviations used in the descriptions hardly call for explanation.

Chemical reactions of the flesh are not given, but may be added later when more complete.

The principal works consulted are :

- J. BRESADOLA, *Iconographia Mycologica*.  
 E. J. GILBERT, *Les Bolets*.  
 F. KALLENBACH, *Die Röhrlinge*.  
 KONRAD AND MAUBLANC, *Icones Selectae Fungorum*.  
 CARLETON REA, *British Basidiomycetae*.

#### KEY TO SPECIES OF BOLETALES

A	With anastomosing subporiform gills . . . . .	<i>Phylloporus rhodoxanthus</i>
B	With pores, round, angular or honeycomb shape . . . . .	I
1	With ring (often fugacious) . . . . .	2
	Without ring . . . . .	9
2	Cap dry . . . . .	3
	Cap viscid when fresh . . . . .	5
3	Cap with large scales, all parts grey-black . . . . .	<i>Strobilomyces strobilaceus</i>
	Cap without large scales . . . . .	4
4	Pores large and alveolate . . . . .	<i>Boletinus cavipes</i>
	Pores smaller . . . . .	5
5	Cap greyish or with greenish scales; under larch . . . . .	<i>Boletus viscidus</i>
	Not grey . . . . .	6
6	Cap orange or rusty; under larch or yew . . . . .	<i>B. tridentinus</i>
	Another colour . . . . .	7



- 7 Cap blackish brown or dark ochre ; under pine . . . . . *B. luteus*  
Cap yellow . . . . . 8
- 8 Slender umbonate ; in boggy places . . . . . *B. flavidus*  
Lemon or golden yellow ; under larch . . . . . *B. elegans*
- 9 Tubes very short, pores labyrinthine ; under alder . . . . . *Gyrodon lividus*  
(not to be confused with young specimens of other species)  
Tubes normally longer, pores round or angular, at least when old . . . . . 10
- 10 Growing on *Scleroderma* . . . . . *Boletus parasiticus*  
Not so . . . . . 11
- 11 Growing on sawdust or conifer stump . . . . . *B. sulphureus*  
Growing on ground . . . . . 12
- 12 Pores pinkish . . . . . *B. felleus*  
Pores olive to smoky brown . . . . . *Porphyrellus porphyrosporus*  
Pores white then pale yellow or greenish . . . . . 13  
Pores another colour . . . . . 15
- 13 Stem smooth or velvety . . . . . 14  
Stem rough with small scales . . . . . 19  
Stem reticulate with fine net . . . . . 31
- 14 Flesh white, turns indigo blue . . . . . *Gyroporus cyanescens*  
Flesh white unchangeable . . . . . *G. castaneus*
- 15 Cap viscid when fresh . . . . . 16  
Cap not viscid . . . . . 18
- 16 Cap cinnamon with stem base yellow . . . . . *Boletus piperatus*  
Cap another colour . . . . . 17
- 17 Cap yellow or rusty, small pores milky . . . . . *B. granulatus*  
Cap reddish yellow with margin white seen from underneath ; pores large  
decurent . . . . . *B. bovinus*  
Cap ochraceous with small innate scales . . . . . *B. variegatus*  
(see also *badius*, *cramesus* and *crocipodius*)
- 18 Stem rough with small scales and ribs or coarse veins . . . . . 19  
Not so . . . . . 23
- 19 Cap orange or reddish . . . . . 20  
Cap greyish, buff, brownish, or black . . . . . 21  
Cap greenish or yellowish, often cracked . . . . . *B. crocipodius*  
Cap white . . . . . *B. holopus*
- 20 Scales on stem blackish or orange . . . . . *B. versipellis*
- 21 Flesh white, unchangeable . . . . . *B. scaber*  
Flesh turns vivid yellow, blue or red at stem base . . . . . *B. scaber* var. *coloripes*  
Flesh turns blackish . . . . . 22
- 22 Robust ; cap minutely cracked ; under poplars . . . . . *B. duriusculus*  
More slender ; cap usually wrinkled or coarsely cracked . . . . . *B. Carpini*
- 23 Stem, tubes and pores carmine ; small size usually . . . . . *B. rubinus*  
Not so . . . . . 24
- 24 Cap pink, pores vivid gold, small size . . . . . *B. cramesinus*  
Cap red or purplish bay, flesh slowly blue ; medium . . . . . *B. versicolor*  
Cap another colour . . . . . 25
- 25 Cap greyish brown to brown, often cracked showing red underneath ;  
flesh yellow, slight blue reaction . . . . . *B. chrysenteron*  
Cap brownish olive, with yellow cracks, often with anastomosing reddish  
ribs . . . . . *B. subtomentosus*  
(see also *B. impolitus*)  
Not like above . . . . . 26
- 26 Cap yellow or milky coffee ; flesh yellow, turns deep blue ; all parts  
finally black . . . . . *B. pulverulentus*  
Not so . . . . . 27
- 27 Cap bay to chocolate, viscid at first ; flesh turns pale azure blue ; not  
veined on stem . . . . . *B. badius*  
Cap bay, not viscid and with yellow net on stem . . . . . *B. appendiculatus*  
With different characters . . . . . 28
- 28 Cap pallid to tawny ; flesh yellow unchangeable ; stem not veined *B. impolitus*  
With different characters . . . . . 29
- 29 Flesh white, at least in cap . . . . . 30  
Flesh yellow . . . . . 34

GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM
<b>STROBILOMYCES</b> Berk. <i>strobilaceus</i> (Scop.) Berk.	5-10 cm. white then dark brown; thick imbricate scales	adnate sinuate; white to brownish, reddish to touch. Pores large angular	medium; sheathed white; sulcate above, blackish below
<b>PORPHYRELLUS</b> Gilbert <i>porphyrosporus</i> (Fr.) Gilb.	7-16 cm. olive to smoky brown; black to touch; velvety	adnate sinuate; grey to olive. Pores yellowish bluish green to touch	robust; velvety; olive smoky brown; with ribs
<b>GYROPORUS</b> Quel. <i>cyanescens</i> (Bull.) Quel.	5-10 cm. tan or dingy white; floccose scaly	free; white, then yellow, bluish to touch	fairly robust; tan to whitish above, pruinose blue to touch
<i>castaneus</i> (Bull.) Quel.	4-7 cm. cinnamon or chestnut; velvety	free; white then yellow	fairly robust; cinnamon to chestnut; minutely velvety
<b>GYRODON</b> Opat. <i>lividus</i> (Bull.) Sacc.	4-10 cm. whitish to light brown or reddish	deeply decurrent; yellow, bluish to touch, then brown. Pores large angular or wavy	slender; light straw brown
<b>BOLETINUS</b> Kallbr. <i>cavipes</i> (Opat.) Klotsch.	3-8 cm. lemon to gold to dark brown; felted scaly	very decurrent; yellow to greenish. Pores honeycomb-like	medium; lemon to tawny below; fibrillose, scaly, sheathed to ring
<b>PHYLLPORUS</b> Quel. <i>rhodoxanthus</i> (Schw.) Bres.	4-8 cm. reddish brown; velvety, then glabrous	decurrent gills anastomosing; subporiform golden, red to touch	medium; yellow with patches, striate subradicate
<b>BOLETUS</b> Fr. A. <b>EDULES</b> Fr. <i>edulis</i> (Bull.) Fr.	10-20 cm. brown to white; smooth or rugose, polished	adnexed; white, then yellow or greenish. Pores small	robust; pallid; network above over
<i>reticulatus</i> (Schaeff.) Boud.	10-15 cm. deep tawny to snuff brown; minutely tomentose	adnexed; white or buff, then green; sometimes golden	robust; white or dense white net to touch
<i>pinicola</i> Vitt.	10-20 cm. reddish brown, velvety, smooth, often with pale tomentose margin	adnexed; cream, then olive, becoming rusty	robust; reddish cream brown; white net to touch brown below
? <i>aereus</i> (Bull.) Fr.	10-20 cm. blackish without red tint; minutely pubescent	adnexed; white, then greenish	robust; reddish with brown net
B. <b>RHODOPORUS</b> Quel. <i>felleus</i> (Bull.) Fr.	6-12 cm. tawny to chestnut; velvety, then glabrous	adnate sinuate; white then pink	medium to robust; ochre netted with veins

FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
, then reddish, then blackish		pleasant	black-purple, sub- globose 10-13 × 8-10 $\mu$ reticulate	frondose and conifer woods; rare	margin often appen- diculate
white, turns smoky ple	rather sour	unpleas.	purplish brown, sub- fusoid 13-18 × 6-7 $\mu$	conifers; uncom- mon	stains white paper green
, turns deep blue; n with spongy pith	mild	pleasant	pale yellow, elliptic, 9-11 × 5-6 $\mu$	woods, especially spruce; rare	blue juice when squeezed
, unchangeable	mild, nutty	pleasant	pale yellow, elliptic, 9-11 × 5-6 $\mu$	frondose woods, chiefly oak; un- common	
yellow above, rusty reddish below	rather sour	pleasant	olive (Kall.), brown- ish ochre (Gilbert), elliptic 4-8 × 3-5 $\mu$	under alders; often hidden in grass	
v above, white or black below	mild	pleasant	greenish yellow, sub- fusoid, 6-10 × 3-4 $\mu$	mixed woods, espec- ially larch; rare	
yellow, reddish ve	mild	pleasant	ochre, subfusoid, 10-15 × 3½-4½ $\mu$	mixed woods, un- common	often eccentric, cys- tidia yellow
, slightly pink near	mild	pleasant	medal bronze, fusoid, 14-17 × 4½-5½ $\mu$	frondose woods; autumn common	
, slightly pink near	mild	pleasant	buffy olive, fusoid, 14-17 × 4½-5½ $\mu$	frondose and conifer woods; summer common	
, slightly pink near	mild	pleasant	greenish yellow, fus- oid 14-17 × 4½-5½ $\mu$	conifers; summer and autumn, un- common	greenish yellow when cooked (Konrad)
; pink near cap	mild	pleasant		?	doubtful if in Britain though recorded
turns pink	very bitter	pleasant	pinkish fawn, fusoid, 12-14 × 4-5 $\mu$	frondose and conifer, common	





GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM	FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
<b>STROBILOMYCES</b> Berk. <i>strobilaceus</i> (Scop.) Berk.	5-10 cm. white then dark brown; thick imbricate scales	adnate sinuate; white to brownish, reddish to touch. Pores large angular	medium; sheathed white; sulcate above, blackish below	white, then reddish, then blackish		pleasant	black-purple, subglobose 10-13 $\times$ 8-10 $\mu$ reticulate	frondose and conifer woods; rare	margin often appendiculate
<b>PORPHYRELLUS</b> Gilbert <i>porphyrosporus</i> (Fr.) Gilb.	7-16 cm. olive to smoky brown; black to touch; velvety	adnate sinuate; grey to olive. Pores yellowish bluish green to touch	robust; velvety; olive smoky brown; with ribs	dingy white, turns smoky purple	rather sour	unpleas.	purplish brown, subfusoid 13-18 $\times$ 6-7 $\mu$	conifers; uncommon	stains white paper green
<b>GYROPORUS</b> Quel. <i>cyaneus</i> (Bull.) Quel.	5-10 cm. tan or dingy white; floccose scaly	free; white, then yellow, bluish to touch	fairly robust; tan bluish above, pruinose blue to touch	white, turns deep blue; stem with spongy pith	mild	pleasant	pale yellow, elliptic, 9-11 $\times$ 5-6 $\mu$	woods, especially spruce; rare	blue juice when squeezed
<i>castaneus</i> (Bull.) Quel.	4-7 cm. cinnamon or chestnut; velvety	free; white then yellow	fairly robust; cinnamon to chestnut; minutely velvety	white, unchangeable	mild, nutty	pleasant	pale yellow, elliptic, 9-11 $\times$ 5-6 $\mu$	frondose woods, chiefly oak; uncommon	
<b>GYRODON</b> Opat. <i>lividus</i> (Bull.) Sacc.	4-10 cm. whitish to light brown or reddish	deeply decurrent; yellow, bluish to touch, then brown. Pores large angular or wavy	slender; light straw brown	pale yellow above, rusty or reddish below	rather sour	pleasant	olive (Kall.), brownish ochre (Gilbert), elliptic 4-8 $\times$ 3-5 $\mu$	under alders; often hidden in grass	
<b>BOLETINUS</b> Kalbr. <i>cavipes</i> (Opat.) Klotzsch.	3-8 cm. lemon to gold to dark brown; felted scaly	very decurrent; yellow to greenish. Pores honeycomb-like	medium; lemon above, tawny below; fibrils scaly, sheathed to waring	yellow above, white or pinkish below	mild	pleasant	greenish yellow, subfusoid, 6-10 $\times$ 3-4 $\mu$	mixed woods, especially larch; rare	
<b>PHYLLOPORUS</b> Quel. <i>rhodoxanthus</i> (Schw.) Bres.	4-8 cm. reddish brown; velvety, then glabrous	decurrent gills anastomosing; subporiform golden, red to touch	medium; yellow with patches, striate above, subradicate	pale yellow, reddish above	mild	pleasant	ochre, subfusoid, 10-15 $\times$ 3 1/2-4 1/2 $\mu$	mixed woods, uncommon	often eccentric, cystidia yellow
<b>BOLETUS</b> Fr. A. <i>EDULES</i> Fr. <i>edulis</i> (Bull.) Fr.	10-20 cm. brown to white; smooth or rugose, polished	adnexed; white, then yellow or greenish. Pores small	robust; pallid; network above or over	white, slightly pink near cap	mild	pleasant	medal bronze, fusoid, 14-17 $\times$ 4 1/2-5 1/2 $\mu$	frondose woods; autumn common	
<i>reticulatus</i> (Schaeff.) Boud.	10-15 cm. deep tawny to snuff brown; minutely tomentose	adnexed; white or buff, then green; sometimes golden	robust; white or buff, dense white net to touch	white, slightly pink near cap	mild	pleasant	buffy olive, fusoid, 14-17 $\times$ 4 1/2-5 1/2 $\mu$	frondose and conifer woods; summer common	
<i>pinicola</i> Vitt.	10-20 cm. reddish brown, velvety, smooth, often with pale tomentose margin	adnexed; cream, then olive, becoming rusty	robust; reddish cream brown; white net above, brown below	white, slightly pink near cap	mild	pleasant	greenish yellow, fusoid 14-17 $\times$ 4 1/2-5 1/2 $\mu$	conifers; summer and autumn, uncommon	greenish yellow when cooked (Konrad)
? <i>aereus</i> (Bull.) Fr.	10-20 cm. blackish without red tint; minutely pubescent	adnexed; white, then greenish	robust; reddish with brown net	white; pink near cap	mild	pleasant		?	doubtful if in Britain though recorded
<b>B. RHODOPORUS</b> Quel. <i>felleus</i> (Bull.) Fr.	6-12 cm. tawny to chestnut; velvety, then glabrous	adnate sinuate; white then pink	medium to robust; ochre netted with veins	white, turns pink	very bitter	pleasant	pinkish fawn, fusoid, 12-14 $\times$ 4-6 $\mu$	frondose and conifer, common	

GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM
<b>BOLETUS</b>			
<i>C. CAERULESCENTI</i> <i>luridus</i> (Schaeff.) Fr.	7-12 cm. umber olive to fuliginous, or with red tint; tomentose	free; yellow, then green. Pores vermillion or orange	medium; yellow, red parts with red net, to touch
<i>erythropus</i> Fr. non Pers.	7-12 cm. bay brown; minutely pubescent	free; yellow, then green. Pores blood red or orange	medium; dotted red, tomentose; no net
<i>purpureus</i> Fr.	7-20 cm. cream, then blue, finally red; min. tomentose	free; yellow, then blue-green, finally red	robust; golden yellow with blood red net; yellow mycelium
<i>Satanas</i> Lenz.	10-20 cm. whitish grey or pale olive; smooth, polished	free; yellow, then green. Pores turn reddish and orange, greenish to touch	robust; short ventricose yellow, red in parts blood red net
<i>Queletii</i> Schulz. var. <i>lateritius</i> Bres.	6-15 cm. reddish brown; pruinose, then sub-tomentose; margin flesh colour	free; yellow with pores orange or saffron; bluish black to touch	medium; straw to ochraceous dotted red; base pointed
<i>calopus</i> Fr.	7-15 cm. whitish grey to olive; sub-tomentose, then smooth	adnate; yellow, turns greenish blue	robust; scarlet, often apex yellow; whitish pinkish net
<i>albidus</i> Roques	7-15 cm. dingy white or grey; sub-tomentose then smooth	adnexed; yellow, turns green	robust; cream or light yellow above, often brownish red below, blue-green to touch; margin curved
<i>appendiculatus</i> (Schaeff.) Fr.	10-15 cm. bay to buff; sub-tomentose	adnate; yellow. Pores sulphur, blue-green to touch	robust; yellowish yellow net, often below
<i>regius</i> Krombh.	10-15 cm. pink to olivaceous; sub-tomentose	adnate; sulphur, blue-green to touch	robust; sulphur, sulphur net, often below
<i>fragrans</i> Vitt.	5-12 cm. pale umber or dark brown; sub-tomentose, then smooth	adnate or adnexed; yellow to olive grey, pale blue to touch	robust; yellowish reddish brown without veins
<b>(IXOCOMUS Quel.)</b>			
<b>Annulati</b>			
<i>luteus</i> (Linn.) Fr.	6-10 cm. glutinous; dark purplish brown or sepia, rarely yellow; smooth or rugulose	yellow, unchangeable	medium; yellowish white or fuscous below, ring white
<i>elegans</i> (Schum.) Fr.	6-10 cm. viscid, lemon to rusty gold; smooth, often wrinkled, polished	decurent; sulphur to gold, reddish to touch	medium; yellowish cent, apex punctate netted; ring white

FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
not yellow, then blue with red patches ; d at base of tubes	mild	pleasant	medal bronze, fusoid, $12-15 \times 5\frac{1}{2}-6 \mu$	frondose woods ; not common	the flesh changes are very variable when old
ow, turns deep blue, sometimes red in stem ; flow at base of tubes	mild	pleasant	medal bronze, fusoid, $9-13 \times 4-6 \mu$	all woods ; common	
ow, turns blue and ally yellow	mild	unpleas.	medal bronze, fusoid, $10-14 \times 4-5 \mu$	frondose woods un- common	
te, then cream, then ue, red in parts	mild	unpleas.	medal bronze, fusoid, $11-13 \times 4-5 \mu$	frondose woods, es- pecially calcar- eous ; uncommon	poisonous
ow, turns green, base d purple	slightly bitter	pleasant	medal bronze, ellip- tic subfusoid, $12-13 \times 5\frac{1}{2}-6 \mu$	frondose woods ; rare	
ow, may instantly n white flushed ; ue or pink in parts	bitter	pleasant	light brown olive fusoid, $12-16 \times 4\frac{1}{2}-5\frac{1}{2} \mu$	chiefly conifers ; un- common	stem is without veins in some forms
te in pileus, yellow stem ; turns blue- green or pink	bitter	pleasant	medal bronze, fusoid, $12-16 \times 4\frac{1}{2}-6 \mu$	frondose woods, es- pecially oak ; un- common	flesh colours very variable
a sulphur above, am in stem, blue red in parts	mild	pleasant	medal bronze, fusoid, $12-14 \times 4-4\frac{1}{2} \mu$	frondose woods ; uncommon	flesh sometimes un- changeable
alemon, turns blue ; at base	mild	pleasant		frondose woods ; rare	probably a colour variety of above
ow, turns slightly green or pinkish	mild	pleasant	golden yellow, fusoid, $10-15 \times 4\frac{1}{2}-5\frac{1}{2} \mu$ sec. bies.	frondose woods ; very rare	
h or slightly yellow ; pinkish base of stem	mild	none	clay colour, sub-fus- oid, $7-10 \times 3-3\frac{1}{2} \mu$	conifers ; common	
l yellow in cap, come in stem ; turns ightly lilac	mild	pleasant	isabella colour, el- liptic or sub-fus- oid, $8-12 \times 3\frac{1}{2}-4 \mu$	larch ; common	





GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM	FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
<b>BOLETUS</b>									
<i>C. CAERULESCENTI</i> <i>luridus</i> (Schaeff.) Fr.	7-12 cm. umber olive to fuliginous, or with red tint; tomentose	free; yellow, then green. Pores vermillion or orange	medium; yellow, red in parts with red net, blue to touch	apricot yellow, then blue or with red patches; red at base of tubes	mild	pleasant	medal bronze, fusoid, 12-15 × 5½-6 μ	frondose woods; not common	the flesh changes are very variable when old
<i>erythropus</i> Fr. non Pers.	7-12 cm. bay brown; minutely pubescent	free; yellow, then green. Pores blood red or orange	medium; dotted red, mat tomentose; no net	yellow, turns deep blue, sometimes red in stem; yellow at base of tubes	mild	pleasant	medal bronze, fusoid, 9-13 × 4-6 μ	all woods; common	
<i>purpureus</i> Fr.	7-20 cm. cream, then blue, finally red; min. tomentose	free; yellow, then blue-green, finally red	robust; golden yellow with blood red net; pale yellow mycelium	yellow, turns blue and finally yellow	mild	unpleas.	medal bronze, fusoid, 10-14 × 4-5 μ	frondose woods uncommon	
<i>Satanas</i> Lenz.	10-20 cm. whitish grey or pale olive; smooth, polished	free; yellow, then green. Pores turn reddish and orange, greenish to touch	robust; short ventricose yellow, red in parts with blood red net	white, then cream, then blue and in parts	mild	unpleas.	medal bronze, fusoid, 11-13 × 4-5 μ	frondose woods, especially calcareous; uncommon	poisonous
<i>Queletii</i> Schulz. var. <i>lateritius</i> Bres.	6-15 cm. reddish brown; pruinose, then sub-tomentose; margin flesh colour	free; yellow with pores orange or saffron; bluish black to touch	medium; straw to ochre dotted red; base often pointed	yellow, turns green, base red purple	slightly bitter	pleasant	medal bronze, elliptic subfusoid, 12-13 × 5½-6 μ	frondose woods; rare	
<i>calopus</i> Fr.	7-15 cm. whitish grey to olive; sub-tomentose, then smooth	adnate; yellow, turns greenish blue	robust; scarlet, often with apex yellow; white pinkish net	yellow, may instantly turn white flushed; blue or pink in parts	bitter	pleasant	light brown olive fusoid, 12-16 × 4½-5½ μ	chiefly conifers; uncommon	stem is without veins in some forms
<i>albidus</i> Roques	7-15 cm. dingy white or grey; sub-tomentose then smooth	adnexed; yellow, turns green	robust; cream or lemon above, often brown red below, blue-green to touch; margin curved	white in pileus, yellow in stem, turns blue-green or pink	bitter	pleasant	medal bronze, fusoid, 12-16 × 4½-6 μ	frondose woods, especially oak; uncommon	flesh colours very variable
<i>appendiculatus</i> (Schaeff.) Fr.	10-15 cm. bay to buff; sub-tomentose	adnate; yellow. Pores sulphur, blue-green to touch	robust; yellow with yellow net, often below	pale sulphur above, cream in stem, blue or red in parts	mild	pleasant	medal bronze, fusoid, 12-14 × 4-4½ μ	frondose woods; uncommon	flesh sometimes unchangeable
<i>regius</i> Krombh.	10-15 cm. pink to olivaceous; sub-tomentose	adnate; sulphur, blue-green to touch	robust; sulphur, with sulphur net, often below	pale lemon, turns blue; red at base	mild	pleasant		frondose woods; rare	probably a colour variety of above
<i>fragrans</i> Vitt.	5-12 cm. pale umber or dark brown; sub-tomentose, then smooth	adnate or adnexed; yellow to olive grey, pale blue to touch	robust; yellow above reddish brown below without veins	yellow, turns slightly blue-green or pinkish	mild	pleasant	golden yellow, fusoid, 10-15 × 4½-5½ μ sec. bies.	frondose woods; very rare	
<b>(IXOCOMUS Quel.)</b>									
<b>Annulati</b>									
<i>luteus</i> (Linn.) Fr.	6-10 cm. glutinous; dark purplish brown or sepia, rarely yellow; smooth or rugulose	yellow, unchangeable	medium; yellow above white or fuscous below ring white	white or slightly yellow; pinkish base of stem	mild	none	clay colour, sub-fusoid, 7-10 × 3-3½ μ	conifers; common	
<i>elegans</i> (Schum.) Fr.	6-10 cm. viscid, lemon to rusty gold; smooth, often wrinkled, polished	decurent; sulphur to gold, reddish to touch	medium; yellow above white or fuscous below netted; ring white	pale yellow in cap, chrome in stem; turns slightly lilac	mild	pleasant	isabella colour, elliptic or sub-fusoid, 8-12 × 3½-4 μ	larch; common	

GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM
<b>BOLETUS</b> <i>flavidus</i> Fr.	3-6 cm. umbonate, viscid, livid yellow; wrinkled	decurrent; angular, dull yellow	slender; pale yellow above with glandular warts; dull yellow or brown below; ring whitish brown with spores
<i>viscidus</i> (Linn.) Fr.	6-10 cm. viscid; livid white or buff, often with dark greenish scales; often wrinkled	sub-decurrent; grey then brown. Pores large, unequal	medium; white, then yellow or grey; a little netted
<i>tridentinus</i> Bres.	6-12 cm. viscid; orange or reddish brown with darker adpressed scales	sub-decurrent; gold to orange, reddish to touch. Pores broad, angular	medium; lemon yellow orange above, dirty white or brownish below; red-brown net at apex
Nudi			
<i>granulatus</i> (Linn.) Fr.	4-10 cm. viscid; rusty, then yellow; smooth	adnate; sulphur yellow. Pores with milky drops	medium; yellow with granular apex
<i>bovinus</i> (Linn.) Fr.	4-8 cm. viscid; reddish buff; smooth; margin white seen from below	decurrent; yellow to rusty. Pores angular	slender; pallid brown smooth
<i>variegatus</i> (Schwartz.) Fr.	7-12 cm. moist; ochraceous, with small dark scales	adnate; pallid, then yellowish or cinnamon	medium; yellow or reddish; smooth
<i>sulphureus</i> Fr.	7-12 cm. usually dry; pale sulphur, silky tomentose	adnate; greenish yellow spotted rusty red	medium; sulphur, then reddish; striate robust
<i>piperatus</i> (Linn.) Fr.	4-6 cm. slightly viscid; cinnamon; smooth	adnate or sub-decurrent; rusty; large angular	slender; cinnamon yellow fusiform base
(XEROCOMUS (Quel.) <i>chrysenteron</i> (Bull.) Fr.	5-10 cm. fawn to reddish brown or olive tint; min. tomentose; often cracks shewing red flesh	adnate or adnexed; sulphur yellow, then greenish	rather slender; scales with yellow apex white base
<i>versicolor</i> Rostk.	5-10 cm. blood red, or purplish bay; min. tomentose; often cracks	adnate; yellow, blue-green to touch	rather slender; yellow apex, red below, blue green to touch
<i>subtomentosus</i> (L.) Fr.	6-12 cm. olive-brown; tomentose; often cracks shewing yellow flesh	adnate; sulphur or golden	rather slender; yellow sulcate fusiform, without anastomosing ribs
<i>parasiticus</i> (Bull.) Fr.	2-5 cm. olive-tawny to olive-brown; min. tomentose	adnate; gold, often with red patches	slender, golden yellow streaked reddish, granular
<i>pulverulentus</i> Op.	4-10 cm. yellow, soon reddish brown or milky coffee, finally black	adnate; lemon to gold, instantly turns blue to touch	sturdy, fusiform; yellow black to touch; peristome pruinose

FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
yellow, turns tly reddish	mild	pleasant	chocolate, sub-fusoid $8-10 \times 3\frac{1}{2}-4\mu$	boggy places ; rare	
in cap, greenish m ; turns slight-	mild	pleasant	snuff brown, sub- fusoid, $10-12 \times 4-5\mu$	larch ; common	very variable in colour according to age
or salmon, then on pink	mild	pleasant	isabella color, sub- fusoid, $10-13 \times 4-5\mu$	larch and yew ; un- common	the reticulation on stem is sometimes absent
yellow, unchange-	mild	pleasant	clay colour, sub-fus- oid, $8-10 \times 2\frac{1}{2}-3\frac{1}{2}\mu$	conifers ; common	
o pinkish	mild	pleasant	light brownish olive sub-fusoid, $8-10 \times$ $3-4\frac{1}{2}\mu$	pinus ; common	
yellow, reddish at s turns azure- in parts	mild	strong, unpleas.	medal bronze, sub- fusoid, $9-11 \times$ $3-4\mu$	pinus ; common	
h, turns greenish are, finally golden red at base			medal bronze, ellip- tical, $6-7 \times 3\mu$	usually on sawdust ; rare	yellow mycelium at base of stem
yellow, reddish	acid	none	snuff brown, ellip- tical, $8-11 \times 3-4\mu$	mixed woods ; com- mon	
yellow, red be- a cap ; turns gly blue, finally h buff	mild	pleasant	medal bronze, fusoid, $12-15 \times 4\frac{1}{2}-5\mu$	grassy edges of fron- dose woods ; com- mon	
at apex, reddish d ; slowly turns a finally dingy v buff	mild	pleasant	medal bronze, fusoid, $11-14 \times 4\frac{1}{2}-5\mu$	grass margins of leafy woods ; fair- ly common	
eomon, turns gly blue sometimes	mild	pleasant	medal bronze, fusoid, $11-15 \times 4\frac{1}{2}-5\mu$	grassy places in or near leafy woods ; common	
reddish in stem	mild	pleasant	"olive," sec. Kallen- bach, fusoid, $12-18 \times 4-4\frac{1}{2}\mu$	parasitic on Sclero- derma ; uncom- mon	specimens rarely drop spores and exact spore colour un- known
turns deep blue ; base	mild	pleasant	medal bronze, fusoid, $11-14 \times 3\frac{1}{2}-5\mu$	mixed woods, espec- ially oak ; un- mon	rarely seen in original colours ; all parts turn black





GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM	FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
<b>BOLETUS</b>									
<i>flavidus</i> Fr.	3-6 cm. umbonate, viscid, livid yellow; wrinkled	decurent; angular, dull yellow	slender; pale yellow above with glandular warts, dull yellow or brownish below; ring whitish or brown with spores	pale yellow, turns slightly reddish	mild	pleasant	chocolate, sub-fusoid $8-10 \times 3\frac{1}{2}-4\mu$	boggy places; rare	
<i>viscidus</i> (Linn.) Fr.	6-10 cm. viscid; livid white or buff, often with dark greenish scales; often wrinkled	sub-decurrent; grey then brown. Pores large, unequal	medium; white, then yellow or grey; apices netted	white in cap, greenish in stem; turns slightly blue	mild	pleasant	snuff brown, sub-fusoid, $10-12 \times 4-5\mu$	larch; common	very variable in colour according to age
<i>tridentinus</i> Bres.	6-12 cm. viscid; orange or reddish brown with darker adpressed scales	sub-decurrent; gold to orange, reddish to touch. Pores broad, angular	medium; lemon yellow to orange above, dingy white or brownish below; red-brown net at apex	lemon or salmon, then salmon pink	mild	pleasant	isabella color, sub-fusoid, $10-13 \times 4-5\mu$	larch and yew; uncommon	the reticulation on stem is sometimes absent
<b>Nudi</b>									
<i>granulatus</i> (Linn.) Fr.	4-10 cm. viscid; rusty, then yellow; smooth	adnate; sulphur yellow. Pores with milky drops	medium; yellow with granular apex	lemon yellow, unchangeable	mild	pleasant	clay colour, sub-fusoid, $8-10 \times 2\frac{1}{2}-3\frac{1}{2}\mu$	conifers; common	
<i>bovinus</i> (Linn.) Fr.	4-8 cm. viscid; reddish buff; smooth; <i>margia</i> white seen from below	decurent; yellow to rusty. Pores angular	slender; pallid brown, smooth	yellow to pinkish	mild	pleasant	light brownish olive sub-fusoid, $8-10 \times 3-4\frac{1}{2}\mu$	pinus; common	
<i>variegatus</i> (Schwartz.) Fr.	7-12 cm. moist; ochraceous, with small dark scales	adnate; pallid, then yellowish or cinnamon	medium; yellow or reddish; smooth	pale yellow, reddish at base, turns azure-blue in parts	mild	strong, unpleasant	medal bronze, sub-fusoid, $9-11 \times 3-4\mu$	pinus; common	
<i>sulphureus</i> Fr.	7-12 cm. usually dry; pale sulphur, silky tomentose	adnate; greenish yellow spotted rusty red	medium; sulphur, then reddish; striate rugulose	sulphur, turns greenish yellow, finally golden often red at base			medal bronze, elliptical, $6-7 \times 3\mu$	usually on sawdust; rare	yellow mycelium at base of stem
<i>piperatus</i> (Linn.) Fr.	4-6 cm. slightly viscid; cinnamon; smooth	adnate or sub-decurrent; rusty; large angular	slender; cinnamon white yellow fusiform base	chrome yellow, reddish in cap	acid	none	snuff brown, elliptical, $8-11 \times 3-4\mu$	mixed woods; common	
( <b>XEROCOMUS</b> (Quel.) <i>chrysenteron</i> (Bull.) Fr.	5-10 cm. fawn to reddish brown or olive tint; min. tomentose; often cracks showing red flesh	adnate or adnexed; sulphur yellow, then greenish	rather slender; scarious with yellow apex at white base	creamy yellow, red beneath cap; turns slightly blue, finally reddish buff	mild	pleasant	medal bronze, fusoid, $12-15 \times 4\frac{1}{2}-5\mu$	grassy edges of frondose woods; common	
<i>versicolor</i> Rostk.	5-10 cm. blood red, or purplish bay; min. tomentose; often cracks	adnate; yellow, blue-green to touch	rather slender; yellow apex, red below, blue green to touch	yellow at apex, reddish below; slowly turns blue, finally dingy olive buff	mild	pleasant	medal bronze, fusoid, $11-14 \times 4\frac{1}{2}-5\mu$	grass margins of leafy woods; fairly common	
<i>subtomentosus</i> (L.) Fr.	6-12 cm. olive-brown; tomentose; often cracks showing yellow flesh	adnate; sulphur or golden	rather slender; yellow sulcate fusiform, with or without anastomosing ribs	pale lemon, turns slightly blue sometimes	mild	pleasant	medal bronze, fusoid, $11-15 \times 4\frac{1}{2}-5\mu$	grassy places in or near leafy woods; common	
<i>parasiticus</i> (Bull.) Fr.	2-5 cm. olive-tawny to olive-brown; min. tomentose	adnate; gold, often with red patches	slender, golden yellow streaked reddish, granular	yellow, reddish in stem	mild	pleasant	"olive," see Kallenbach, fusoid, $12-18 \times 4-4\frac{1}{2}\mu$	parasitic on Scleroderma; uncommon	specimens rarely drop spores and exact spore colour unknown
<i>pulverulentus</i> Op.	4-10 cm. yellow, soon reddish brown or milky coffee, finally black	adnate; lemon to gold, instantly turns blue to touch	sturdy, fusiform; yellow black to touch; purplish pruinose	yellow, turns deep blue; red at base	mild	pleasant	medal bronze, fusoid, $11-14 \times 3\frac{1}{2}-5\mu$	mixed woods, especially oak; uncommon	rarely seen in original colours; all parts turn black

GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM
<b>BOLETUS</b>			
<i>badius</i> Fr.	8-12 cm. viscid, polished when dry; bay to chocolate; pubescent	adnate; cream or lemon, green to touch	medium; pale bristly rugulose; tomentum at base
<i>cramesinus</i> Secr.	2-5 cm. viscid; pink or crushed strawberry speckled; min. wrinkled	sinuate decurrent; chrome yellow; pores vivid gold	slender; yellow; pi base, striate fibrill
<i>impolitus</i> Fr.	6-20 cm. clay color to tawny olive, brownish to touch; flocculose at length rivulose	adnate or free; lemon, green to touch	robust; lemon above with a darker pubes below, reddish brown to touch
<i>rubinus</i> W. G. Smith	3-8 cm. tan like dull leather, mat; often cracks shewing pallid flesh	sub-decurrent; at first carmine, then dilute pink; pores also carmine	stumpy, short, obconical; rich carmine above, pur yellow below
(TRACHYPUS Bataille = KROMBHOLZIA Karst.) <i>scaber</i>	6-15 cm. grey, umber to black; min. tomentose, then smooth	adnate or almost free; white or dingy buff, yellowish brown to touch	medium; white, striate rough, with small black or black scales, green to touch at base
<i>scaber</i> var. <i>coloripes</i> Singer	—	—	—
<i>holopus</i> Rostk.	2-7 cm. white; pubescent then smooth	adnate or nearly free; white, then greenish grey	slender, white or green, rugulose, flocculose with small white scales
<i>versipellis</i> Fr.	6-15 cm. tawny orange; tomentose	adnexed; white to dingy grey or olive-grey	large; greyish white, striately flocculose with small black, brown or orange scales
<i>duriusculus</i> Schulz	6-12 cm. cinnamon buff, then brown; min. pubescent, aspect stippled, closely cracked, cuticle overlaps margin	adnate; greyish buff; pores small	robust; white, often green base; striately flocculose with granules or scales
<i>crocipodius</i> Letellier.	4-10 cm. viscid at first; tawny olive to olive-brown, sometimes with reddish tinge; tomentose, soon cracks	free; bright yellow, greenish to touch	medium; pale yellowish; striately flocculose with small black or grey scales
<i>Carpini</i> (R. Schulz) Pearson	4-6 cm. pale buff, snuff brown to tawny olive; pruinose at first, glabrous, unevenly wrinkled; usually cracks shewing white flesh	free; cream buff, slight yellow tint; grey or brown to touch; tubes project beyond cuticle of cap	slender; white or yellowish grey, deeply punctate with small black scales swollen at base or middle

FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
or pale lemon, s azure blue	mild	pleasant	brownish olive, fusoid, $13-15 \times 4\frac{1}{2}-6\mu$	chiefly under conifers; uncommon	
a, then faint pink	mild	pleasant	clay colour, fusoid, $11-15 \times 4\frac{1}{2}-5\frac{1}{2}\mu$	frondose woods, especially burnt places; rare	
or tinged yellow changeable	mild	unpleas.	medal bronze, fusoid, $10-14 \times 4\frac{1}{2}-5\frac{1}{2}\mu$	frondose woods, on clay soil; uncommon	looks like large <i>B. subtomentosus</i>
with flush of yellow or pink above and ne below	mild	pleasant	light brown, broadly elliptic, $5\frac{1}{2}-6\frac{1}{2} \times 4\frac{1}{2}-4\frac{3}{4}\mu$	frondose woods, especially oaks; rare	though typically obconical with pointed base, some specimens have a swollen base
unchangeable, or t trace pink	mild	pleasant	snuff brown, fusoid, $15-18 \times 5-5\frac{1}{2}\mu$	under birch; common	surface of cap with long hyphae about $5\mu$ wide; no globose cells
x turning vivid w, red or blue at e base	—	—		rare	
e turning slightly	—	—	fusoid, $16-19 \times 5-6\mu$	under birch; rare	
e then pink, often green at base; y grey-black	—	—	snuff brown, fusoid $13-16 \times 4-5\mu$	frondose woods, especially birch; common	this may be split into two species, but more observation required
e then salmon pink blackish; spotted e at base	—	—	snuff brown, elliptic-fusoid, $12-15 \times 4\frac{1}{2}-5\mu$	under poplar; uncommon	reaction of flesh very variable
h white, turns ash	—	—	medal bronze, fusoid, $12-16 \times 5-6\mu$	deciduous woods; uncommon	the gradations of flesh colour vary; pink appears sometimes
e to pale yellow, reddish or violet grey, finally black	—	—	snuff brown, fusoid, $10-20 \times 5-7\mu$	frondose wood, especially hornbeam or coppice with hazel; uncommon	surface of cap with globose cells





GENUS AND SPECIES	PILEUS	TUBES AND PORES	STEM	FLESH	TASTE	SMELL	SPORES	HABITAT	NOTES
<b>BOLETUS</b>									
<i>badius</i> Fr.	8-12 cm. viscid, polished when dry; bay to chocolate; pubescent	adnate; cream or lemon, green to touch	medium; pale brown, striate rugulose; tomentum at base	white or pale lemon, turns azure blue	mild	pleasant	brownish olive, fusoid, $13-15 \times 4\frac{1}{2}-6\mu$	chiefly under conifers; uncommon	
<i>cramesinus</i> Secr.	2-5 cm. viscid; pink or crushed strawberry speckled; min. wrinkled	sinuate decurrent; chrome yellow; pores vivid gold	slender; yellow; pin base, striate fibrillos	whitish, then faint pink	mild	pleasant	clay colour, fusoid, $11-15 \times 4\frac{1}{2}-5\frac{1}{2}\mu$	frondose woods, especially burnt places; rare	
<i>impolitus</i> Fr.	6-20 cm. clay color to tawny olive, brownish to touch; flocculose at length rivulose	adnate or free; lemon, green to touch	robust; lemon above, with a darker pubes below, reddish brown touch	white or tinged yellow, unchangeable	mild	unpleas.	medal bronze, fusoid, $10-14 \times 4\frac{1}{2}-5\frac{1}{2}\mu$	frondose woods, on clay soil; uncommon	looks like large <i>B. subtomentosus</i>
<i>rubinus</i> W. G. Smith	3-8 cm. tan like dull leather, mat; often cracks shewing pallid flesh	sub-decurrent; at first carmine, then dilute pink; pores also carmine	stumpy, short, obconoid, rich carmine above, plur yellow below	cream, or flush of yellow; pink above and chrome below	mild	pleasant	light brown, broadly elliptic, $5\frac{1}{2}-6\frac{1}{2} \times 4\frac{1}{2}-4\frac{1}{2}\mu$	frondose woods, especially oaks; rare	though typically obconical with pointed base, some specimens have a swollen base
( <i>TRACHYPUS</i> Bataille = <i>KROMBHOLZIA</i> Karst.) <i>scaber</i>	6-15 cm. grey, umber to black; min. tomentose, then smooth	adnate or almost free; white or dingy buff, yellowish brown to touch	medium; white, straw rough, with small black or black scales, green to touch at base	white, unchangeable, or slight trace pink	mild	pleasant	snuff brown, fusoid, $15-18 \times 5-5\frac{1}{2}\mu$	under birch; common	surface of cap with long hyphae about $5\mu$ wide; no globose cells
<i>scaber</i> var. <i>coloripes</i> Singer	—	—	—	white, turning vivid yellow, red or blue at stem base	—	—	—	rare	
<i>holopus</i> Rostk.	2-7 cm. white; pubescent then smooth	adnate or nearly free; white, then greenish grey	slender, white or green, rugulose, flocculose with small white scales	white, turning slightly green	—	—	fusoid, $10-19 \times 5-6\mu$	under birch; rare	
<i>versipellis</i> Fr.	6-15 cm. tawny orange; tomentose	adnexed; white to dingy grey or olive-grey	large; greyish white, striately flocculose; small black, brown or orange scales	white, then pink, often blue-green at base; finally grey-black	—	—	snuff brown, fusoid $13-16 \times 4-5\mu$	frondose woods, especially birch; common	this may be split into two species, but more observation required
<i>duriusculus</i> Schulz	6-12 cm. cinnamon buff, then brown; min. pubescent, aspect stippled, closely cracked, cuticle overlaps margin	adnate; greyish buff; pores small	robust; white, often green base; striately flocculose with black granules or scales	white, then salmon pink green base; strictly blackish; spotted green at base	—	—	snuff brown, elliptic-fusoid, $12-15 \times 4\frac{1}{2}-5\mu$	under poplar; uncommon	reaction of flesh very variable
<i>crocipodius</i> Letellier.	4-10 cm. viscid at first; tawny olive to olive-brown, sometimes with reddish tinge; tomentose, soon cracks	free; bright yellow, greenish to touch	medium; pale yellowish white, turn whitish; striately flocculose with small yellow or grey scales	yellowish white, turns blackish	—	—	medal bronze, fusoid, $12-16 \times 5-6\mu$	deciduous woods; uncommon	the gradations of flesh colour vary; pink appears sometimes
<i>Carpini</i> (R. Schulz) Pearson	4-6 cm. pale buff, snuff brown to tawny olive; pruinose at first, glabrous, unevenly wrinkled; usually cracks shewing white flesh	free; cream buff, slight yellow tint; grey or brown to touch; tubes project beyond cuticle of cap	slender; white or yellowish grey, deeply sulcate punctate with green black scales swollen base or middle	white to pale yellow, turns reddish or violet when dry, finally black	—	—	snuff brown, fusoid, $10-20 \times 5-7\mu$	frondose wood, especially hornbeam or coppice with hazel; uncommon	surface of cap with globose cells

- 30 White flesh unchangeable . . . . . 31  
 White flesh turns bluish-green . . . . . 32  
 31 Cap white to brown, polished ; stem with fine net . . . . . *B. edulis*  
 Cap cream to snuff brown, minutely tomentose ; stem reticulate with  
 veins to base . . . . . *B. reticulatus*  
 Cap reddish-brown, velvety, pores cream turn rusty . . . . . *B. pinicola*  
 Cap black with no trace of red . . . . . *B. aereus*  
 32 Pores start yellow, turn orange red ; stem with red veins . . . . . *B. Satanas*  
 Pores yellow, then green ; stem yellow veined . . . . . *B. albidus*  
 Pores yellow then bluish-green ; stem with whitish veins . . . . . *B. calopus*  
 34 Flesh turns blue . . . . . 35  
 Flesh sometimes unchangeable . . . . . 42  
 35 Stem reticulate with veins . . . . . 36  
 Stem not veined . . . . . 43  
 36 Cap pallid then red. All parts turn blue to touch and finally red . . . . . *B. purpureus*  
 Not so . . . . . 37  
 37 Cap whitish . . . . . 38  
 Cap another colour . . . . . 41  
 38 Stem reticulate with red veins . . . . . *B. Satanas*  
 Stem with yellow veins . . . . . *B. albidus*  
 (see also next)  
 40 Flesh yellow but may instantly turn white ; stem with white or flesh net  
 on red background . . . . . *B. calopus*  
 41 Stem red veined . . . . . *B. luridus*  
 Stem with yellow veins or red below ; cap bay . . . . . *B. appendiculatus*  
 Ditto, cap pink or olivaceous . . . . . *B. regius*  
 42 Cap bay to buff ; flesh pale sulphur, turns red or blue in parts or un-  
 changed ; stem yellow net . . . . . *B. appendiculatus*  
 Ditto, cap pink or olivaceous . . . . . *B. regius*  
 43 Cap bay ; pores red or orange ; stem punctate red . . . . . *B. erythropus*  
 Cap reddish brown ; pores saffron ; flesh turns greenish and red at base ;  
 stem punctate . . . . . *B. Queletii* var. *lateritius*  
 Cap umber, stem yellow and red ; smooth . . . . . *B. fragrans*

## EXCLUDED NAMES

*Boletus aestivalis* (Paul) Fr. Pale form of *appendiculatus*.

*B. alutarius* Fr.=*felleus*.

*B. aurantioporus* Howse.=*B. tridentinus*.

*B. auriporus* Peck.=*cramesus*.

*B. candicans* Fr. Identity doubtful, probably *albidus*.

*B. carnosus* Rostk.=*badius*.

*B. collinitus* Fr. Probably *luteus* without ring.

*B. cruentus* Vent.=*impolitus*.

*B. erythropus* Pers. non Fr.=*Queletii* Schulz.

*B. flavus* (With.) Fr. (1835). Usually assumed to be identical with *elegans* Fr. (1836), in which case *flavus* is the valid name, but neither may be correct because *B. Grevillei* Klotzsch., published in *Linnaea*, Vol. 7 (1832), may ultimately be proved to be valid. For the present the most familiar name *elegans* may stand.

*B. laricinus* Berk.=*viscidus*.

*B. leucophaeus* Pers. Many French mycologists are associating this epithet with the birch wood *scaber*, but in the Persoon diagnosis the flesh blackens, so it cannot be this species. In my list of the Fungi of Epping Forest (1938) I adopted the French views without sufficient study of the facts.

*B. miniatoporus* Secr.=*erythropus* Fr. non Pers.

*B. nigrescens* Roze and Rich.=*crocipodius* Let. Of the many epithets applied to this species by modern authors, each has some point which appears to invalidate its priority. *B. crocipodius* is based on a good coloured illustration by Letellier (1838).

*B. olivaceus* (Schaeff.) Fr.=*calopus*.

*B. pachypus* Fr. Identity doubtful ; either *calopus* or *albidus*.

*B. paludosus* Masee. Uncertain, may be form of *badius* growing in Sphagnum.

- B. pruvinatus* Fr. A doubtful species midway between *chrysenteron* and *versicolor*.  
*B. purpurascens* Rostk. Looks like a form of *versicolor*.  
*B. pusio* Howse. Not adequately described.  
*B. Queletii* Schulz. var. *rubicundus* Maire.=var. *lateritius* Bres. (1885). The type has not yet been recorded for Britain but should be found one of these days. The var. *rubicundus* was Maire's interpretation in 1910 of a form of *purpureus* recorded in Massee's *Fungus Flora*, Vol. 1, p. 290, from Cumberland. I have recently collected it in Surrey. It may easily be passed as a form of *erythropus*.  
*B. radicans* Fr.=*albidus* Roques.  
*B. radicans* Pers.=*pulverulentus* Opat.  
*B. rhodoxanthus* (Krombh.) Kallenbach.=*purpureus* Fr.  
*B. Rostkovii* Fr. Named by Fries from Plate 18 in the little volume by Rostkovins in Sturm's *Die Pilze Deutschlands*. Gilbert thinks it may be the same as *tumidus* Fr. (not recorded for Britain), but further observation required.  
*B. rubiginosus* Fr. Suggests *reticulatus*.  
*B. rugosus* Fr. In error Fries adopted *B. rugosus* from Sowerby, who under this name illustrated a *Polyporus* which looks like *rufescens* (*Daedalea biennis*). Fries in *Hym. Eur.* refers to Sowerby t. 420, but this plate is named *Boletus lactifluus* and is obviously *B. granulatus*. It is not unlikely that Fries meant to refer to t. 421 illustrating *Boletus fusco-albidus*.  
*B. rutilus* Fr. Identity uncertain, may be *Queletii*.  
*B. sanguineus* (With.) Quel.=*cramesinus*.  
*B. sanguineus* (With.) sensu Kallenbach.=*versicolor*.  
*B. scaber* Bull. Many French authors identify this with a species hitherto unrecorded for Britain though fairly common. It was described and illustrated by F. Kallenbach in 1935 as *B. pseudo-scaber*, but this epithet had already been used so a new name must be found. R. Schulz in 1924 described very inadequately a var. *Carpini*, and this name can be adopted. It is, however, worthy to rank as a full species and appears as such in this list. The species we identify as *scaber* is the one which usually grows under birch and has white flesh unchangeable when exposed to the air except for a very slight pink tinge. There is a variety which occurs sometimes with chrome yellow colour at base of stem, which changes to blue or red; this has been called var. *coloripes* by Singer in *Annales Mycologici* (1842).  
*B. spadiceus* (Schaeff.) Fr. Not very clearly defined; probably a form of *subtomentosus* with white flesh and very prominent anastomosing ribs on the stem.  
*B. sphaerocephalus* Bařta. A luxuriant form of *B. sulphureus* on sawdust.  
*B. tenuipes* (Cke.) Massee=*cramesinus* Secr.  
*B. varicolor* B. and Br. Doubtful.  
*B. versipellis* Fr. *Epicrisis* 1936. Left in list, but may have to give way to another or two other names, *B. aurantiacus* Bull. and *B. rufus* Schaeff., both used between 1821 and 1836, though not clearly defined as separate entities. It is, however, doubtful if there are really two valid species; meanwhile, *versipellis* may stand as representing both forms.  
*Gyrodon caespitosus* Massee. Caespitose form of *Boletus pulverulentus* Op. with short tubes not fully developed. The painting by Massee in the Kew Herbarium confirms this.  
*G. sistotrema* Fr.=*lividus*.  
*G. rubellus* McWeeney. Probably *Boletus versicolor*. Most of the British records of *Gyrodon* probably refer to young specimens of *Boletus* when the tubes are short and the pores more or less labyrinthine. *Boletus lividus* is the only fully authenticated species, and though not recorded for Britain under this name, it is included on the assumption that *sistotrema* is the same.  
*Gyroporus lacteus* (Lev.) Quel.=pallid form of *cyaneascens*.  
*Phaeoporus porphyrosporus* (Fr.) Bataille. Replaced by *Porphyrillus* Gilbert, the epithet *Phaeoporus* having been used by Schroeter for a genus of polypores.  
*Tylopus*. Replaced by *Boletus*.

## A FURTHER NOTE ON MARTIN LISTER, WITH A REFERENCE TO *AMMONITES RENIFORMIS* BRUGUIÈRE

J. WILFRID JACKSON, D.Sc., F.S.A., F.G.S.

SOME months ago Mr. C. E. N. Bromehead called my attention to the fact that Joshua Childrey (1661) makes some reference to the stones and fossils of Yorkshire, thus anticipating Martin Lister by some seventeen years. On page 159 of his book Childrey says, 'At Whitbay are Serpents (or snakes) of stone found.' He also mentions them as occurring in rounded stones at 'Huntby Nab,' and in Somerset, Gloucestershire and other places. Jet is referred to as being found on the shore near 'Moulgrave Castle.' Speaking of the hills of Richmondshire, Childrey says, 'on the tops of these hills stones have been found like Sea-winkles, Cockles, and other fish. Which (saith Camden) are either naturall, or else are the reliques of Noah's flood petrified.' These scanty references by Childrey can hardly be regarded as of scientific importance and Martin Lister remains the pioneer describer of Yorkshire fossils.

Opportunity is taken here to call attention to the fact that one of Lister's fossils, the very small goniatite described by him in 1678 from 'Soap-balls' at Colne, Lancashire, was described by Bruguière (1789) as *Ammonites reniformis* Nob. After the name of the species he describes it as follows: *Ammonites reniformis* anfractibus depressis, primario sextuplo majori, umbilico utrinque prominulo.' After quoting Lister's description in full, Bruguière cites two other descriptions (both invalid), viz. one by Lang (1708) and the other by Bourget (1742). Bruguière says the species occurs in coal mines in the mountains of Cévennes, usually in the black shales which form the upper layer of the mines. He further states, 'Found principally in Bayard, diocese of Uzes, where it occurs mixed with a small species of *Pecten* not yet described.' (Translation.)

Specimens of the species from the Soapstone Bed over the Bullion Coal at Trawden, near Colne, were figured by Wild (1892) as *Goniatites atratus* (Goldf.). Other specimens from the same locality were referred to *Dimorphoceras gilbertsoni* (Phil.) by H. Bolton (1905) and to *D. discrepans* (T. Brown) by G. C. Crick in the same year.

From a study of topotypes from the Soapstone Bed at Colne, I find that the suture is not that of *Dimorphoceras*, but is similar to that of *Anthracoceras*. Lister's species, therefore, might be known as *A. reniformis* (Brug.).

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**A Water-Beetle New to Vice-County 64.**—The afternoon of March 6th, 1945, was dull and cold when investigations were being made into the beetle content of a rather deep ditch bordering the Monk Fryston Road about half a mile from the village of Gateforth, near Selby. The water was not fouled as it contained numerous clumps of water-weed (*Potamogeton pectinatus* Linn.) though the bottom was thick with leaf refuse. As it is my intention to furnish a detailed list of my captures in the district of Gateforth in a later issue, I need only call attention here to a single interesting example out of seventeen specimens of the genus *Haliplus* Lat. taken upon this occasion. Four species of the genus were represented including one female *H. heydeni* Weh. which appears to provide the first record for this species in V.C. 64 and only the second record for Yorkshire.

The species was first noted in the county by the Rev. E. J. Pearce who took a single specimen in the River Derwent at Malton (*Naturalist*, 1937, p. 212). The new Vice County record supports the evidence of this species occurring in small ponds or ditches as well as in large rivers.

My thanks are due to the Rev. E. J. Pearce for the determination in this connection.—J. R. DIBB.



## A PRELIMINARY LIST OF YORKSHIRE TRYPETID FLIES (DIPTERA, TRYPETIDAE)

W. D. HINCKS, M.P.S., F.R.E.S.

AMONGST the rather neglected families of Diptera, or two-winged flies, arranged under the large section Acalypterae, the Trypetidae have perhaps attracted the most attention. This is attributable to the very attractive appearance of their spotted, banded, or latticed wings, their interesting life histories, and the relative ease with which they can be reared and studied. Abroad, where they are known as Fruit-flies, this family has received considerable attention as a number of species are of great economic importance. These include such pests as the Mediterranean Fruit-fly, Melon fly, Olive fly, etc. (Niblett, 1939). In this country, however, the economic importance of the family is practically limited to the Celery fly, *Philophylla (Acidia) heraclei* (L.), which is sometimes a serious pest of celery and parsnips (Smith, 1931).

Some species are leaf-miners in the larval stage, whilst many others develop in the flower-heads of composites and allied plants, sometimes enclosed in woody gall-like thickenings of the receptacle. Still other species live as larvae in the stems of the host plant, and a few live singly in the fruits of the rose, hawthorn, white bryony, etc. Many species are relatively easily bred, and the seed-heads of knapweeds, thistles, etc., collected in autumn, will often yield several species in the following spring together with their often numerous hymenopterous parasites.

Relatively little interest has been taken in the family in the county, but it is thought that the provision of this preliminary list of the Yorkshire species may serve as an incentive to future observers. The basis of the list is the record cards of the late Dr. W. J. Fordham, now belonging to the Yorkshire Naturalists' Union and deposited at the Yorkshire Museum, York, where I have been able to examine them through the kindness of the Keeper, Mr. R. Wagstaffe. I have supplemented these data with much additional matter from the records of Mr. C. A. Cheetham, whom I wish to gratefully thank for so readily putting his cards at my disposal and for further valuable information. Mr. J. Wood has always collected these flies whenever possible, and by his careful work I am able to add a number of new records. I must express my appreciation of Mr. Wood's invaluable help, and also the assistance given by Mr. H. W. Andrews in naming some of our material.

The nomenclature of the Trypetidae is in an unsatisfactory state, and further work will no doubt necessitate alterations. In the present list I have followed the *Check List of British Insects* (Kloet and Hincks, 1945). Of the 76 species therein included (of which 4 are indicated as doubtfully British), 28 and 2 doubtful ones are all that appear to be known from the county.

The botanical nomenclature follows as nearly as possible Druce's *British Plant List*, ed. 2, 1928.

The collectors initials are as follows. Where initials are enclosed in round brackets after those of the collector they indicate the authority for the determination.

H.W.A. = H. W. Andrews.  
J.H.A. = J. H. Ashworth.  
H.A. = H. Audcent.  
H.B. = H. Britten, Jun.  
J.M.B. = J. M. Brown.  
H.J.B. = H. J. Burkill.  
C.A.C. = C. A. Cheetham.  
J.E.C. = J. E. Collin.  
W.F. = W. Falconer.

W.J.F. = W. J. Fordham.  
P.H.G. = P. H. Grimshaw.  
W.D.H. = W. D. Hincks.  
P.I. = P. Inchbald.  
S.L.M. = S. L. Mosley.  
T.S. = T. Stainforth.  
V.C.H. = *Victoria County History*.  
J.W. = J. Wood.

### [UROPHORA SOLSTITIALIS (L.).]

There are many Yorkshire records under this name which is now restricted to a species associated with the thistles *Carduus nutans* L. and *Cirsium lanceolatum* Scop. The species bred from *Centaurea nigra* L. was separated as distinct by Hering in 1935 under the name of *U. jaceana* (C. *Jacea* L., a non-British plant, being its more usual foodplant on the continent). The county records definitely associated with black knapweed are therefore transferred to *U. jaceana*, whilst the others are entered here for convenience of reference, but it must be remembered

that they most probably also apply to *U. jaceana*, which is our common species. Collin (1937) says that *U. solstitialis* is less common in Britain than on the continent. It appears to be a local species, but it may well occur in the county.

61. Melbourn, General Lane, 18/6/19, W.J.F. (J.E.C.); 25/6/19, W.J.F., C.A.C. Allerthorpe, 2/7/27, W.D.H., *Nat.*, 1927, 334; 9/7/28, W.J.F. (J.E.C.). Frog Hall, 13/7/29, W.J.F. Bubwith, C.A.C.
62. Crathorne, 17/7/21, W.J.F. (C.A.C.). Uppang, 13/7/34, H.B. Sandsend, 21/7/34, H.B. Hawnby, 5/7/26, C.A.C.
64. Ripon, 7/37, C. Morley.

#### UROPHORA JACEANA (Hering).

Common and generally distributed throughout the country. See notes under *U. solstitialis*. Larvae in flower heads of *Centaurea nigra* L. and other species. *U. cuspidata* (Mg.), not yet recorded from Yorkshire, is said to be associated with *C. Scabiosa*.

61. Frog Hall, W.F., *Nat.*, 1927, 338. Rillington, W.F., *Nat.*, 1927, 338. Skipwith, 15/6/40, J.W. (H.W.A.). Allerthorpe Common, 30/6/45, W.D.H., *Nat.*, 1945, 143. Pocklington Canal, abundant, 1/7/45, W.D.H., *Nat.*, 1945, 143.
62. Whitby, S.L.M., *Nat.*, 1892, 273; V.C.H. Scalby Mills, Cayton Bay, Silpho Moor, J.M.B., *Nat.*, 1920, 74. Carnelian Bay, Robin Hood's Bay, H.J.B., *Nat.*, 1922, 194. Danes Dyke, Sewerby, W.F., *Nat.*, 1918, 384. Scarborough, W.F., *Nat.*, 1919, 392; 1920, 74. ...
63. Huddersfield, 1860, P.I., V.C.H.; S.L.M., *Nat.*, 1892, 273; V.C.H.; *British Galls*, 1903, 34; W.F., *Nat.*, 1918, 167; 1924, 215. Keighley, Holmehouse Wood, 4/7/42, 14/6/45 (bred from *C. nigra*), J.W. (W.D.H.).
64. Selby, banks of River Ouse, W.F., *Nat.*, 1922, 130. Lawkland Moss, 1/8/40, C.A.C. Aberford, 27/7/37, J.W. (H.W.A.), *Nat.*, 1943, 27. Brayton, Selby, 6/8/45, W.D.H.
65. Boroughbridge, north bank River Ure, 14/7/45, W.D.H., *Nat.*, 1945, 144.

#### [UROPHORA MACRURA (Loew, H.).]

Although there are several British records under this name, Collin (1937) states that he had not seen any specimens and suggests that the records may apply to *U. cuspidata* (Mg.). Confirmation of our county record is therefore very desirable.

61. Allerthorpe Common, 21/6/25. Dr. Fordham's card gives the record as 'C.A.C. (3). One spn. given to W.J.F. I also got a few ♂ and ♀ by sweeping herbage by Sutton Rd., W.J.F., *Nat.*, 1931, 123.' Mr. Cheetham tells me that he has no knowledge of these specimens and it is possible that there is some mistake as Fordham's note in *Nat.*, 1931, 123, gives no indication that anyone other than himself took the specimen or specimens on which his record is based. Fordham's collections have been destroyed by enemy action so that re-examination is impossible.

#### UROPHORA STYLATA (F.).

Stated to be common in June and July in the south of England. Larvae in hard, nut-like galls in aborted seed-heads of *Cirsium lanceolatum* Scop., *Carduus nutans* L., and *Cirsium arvense* (L.) Scop. in autumn. The present record appears to be the most northerly yet noted.

61. Skipwith, 15/6/40, on thistle, A. Smith (C.A.C.), *Nat.*, 1940, 235; 1941, 21.

#### PLATYPARELLA DISCOIDES (F.) (PLATYPAREA).

This rare species is one of our Yorkshire prizes. It does not appear to occur in the South of England, is rare in the Midlands, but is found as far north as Dumfriesshire. Adults fly for a short period only, at the end of May and beginning of June. Larvae live in the stems of *Campanula latifolia* L. (see C.A.C., *Nat.*, 1930, 424).

62. Hutton le Hole, 5/6/37, C.A.C., *Nat.*, 1938, 42.
64. Addingham, 28/5/12, J.H.A., *Nat.*, 1920, 232. Malham, 4/6/20, G. T. Porritt. Colt Park, Ribbleshead, 26/5/26, C.A.C. Austwick, 29/5/27,

5/6/30, 16/5/40, C.A.C., *Nat.*, 1930, 424. Bolton Woods, 18/5/35, 27/5/39, J.W. (W.D.H.).

#### RHAGOLETIS ALTERNATA (Fall.).

Larvae in rose-hips, pupating in the ground when full fed. Few records, but found as far north as Scotland. Adults on the wing in June, July, and August.

63. Shelley, 6/22, bred from rose hips, H. D. Smart (P.H.G.), *Nat.*, 1926, 119; 1927, 145 (specimen in Fordham collection, now destroyed).

#### EURIBIA ZOË (Mg.) (SPILOGRAPHA).

A very common and widely distributed species. A leaf-miner of many different plants, including *Senecio Jacobaea* L., *S. erucifolius* L., *S. squalidus* L., *S. vulgaris* L., *Cirsium lanceolatum* Scop., *Eupatorium cannabinum* L., *Artemisia vulgaris* L., *Chrysanthemum*, and other garden composites. Larvae pupate towards the end of June and emerge at the end of July, but adults are also common at the end of May and in June. I have seen material ranging from May 15th to September 11th.

61. Allerthorpe, 5/6/22, W.J.F. Bubwith, 26/6/23, W.J.F. South Cave, 6/6/42, C.A.C., *Nat.*, 1943, 27.  
 62. Ryedale, 21/5/23, C.A.C. Buttercrambe Woods, 18/7/27, W.D.H., *Nat.*, 1927, 243. Fyling Hall, 6/28, W.J.F.  
 63. Farnley, C.A.C. Windmill, B. Morley, Coxley Valley, 6/25, C.A.C., *Nat.*, 1925, 240. Keighley, Holmehouse Wood, 30/6/40, 5/8/40, 28/6/41, 1/7/44, 1/8/45; Morton, 15/8/42; Woodhouse, 15/6/41; Marley, 26/8/37, 10/9/37, 11/9/37; Old Cut River, 10/7/43, J.W. (W.D.H.). Bingley, St. Ives, 2/6/44, 17, 19, 25/8/45, J.W. Hainworth, 17/6/45, J.W.  
 64. Bolton Woods, 18/6/96; Burley-in-Wharfedale, 8/97, P.H.G., V.C.H. Crag Wood, Rawdon, Wistow, Nidd, 29/8/28, Keasden, 13/6/34, C.A.C. Leeds, Halton, 6/27, W.J.F. Chapeltown, 5/7/34, J. R. Dibb. Oakwood, 15/5/43, 5/6/43, 17/6/44, 1/7/44, 6/45, 4/8/45, *in cop.*, W.D.H. Shipley Glen, 6/6/42, J.W.  
 65. Bishopdale, C.A.C., *Nat.*, 1922, 316.

#### PRIONIMERA COGNATA (Wied.) (ACIDIA).

A common and widely distributed species mining the leaves of *Tussilago Farfara* L. (Coltsfoot) and *Petasites hybridus* (L.) in autumn. On the wing from early June to late September.

61. Robin Hood's Bay, 2/9/27, W.J.F.  
 62. Clifton Ings, York, 18/7/42, J.W.  
 63. Bradford Canal, J.H.A. Coxley Valley, 25/6/25, C.A.C., *Nat.*, 1925, 240. Keighley, Royd Lane, 21/8/43; Holmehouse Wood, 9/8/36, 23/8/36, 13/9/36, 22/8/37, 28/8/37, 29/8/37, 5/9/37, 5/8/39, 19/8/39, 23/9/39, 18/6/40, 27/7/40, 5/8/40, 25/8/40, 25/7/42, 23/8/42, 6/9/42, 29/7/43, 18/9/43, 14/7/45, 2/9/45; Marley, 29/7/37, 28/8/37, J.W.  
 64. Burley-in-Wharfedale, 7/04, P.H.G., V.C.H. Crag Wood, Rawdon, 28/6/21, C.A.C. Saxton, 12/7/24, C.A.C., *Nat.*, 1924, 345. Aberford, 29/7/41, J.W. Shipley Glen, 2/8/41, J.W.  
 65. Bedale, 8/23, C.A.C., *Nat.*, 1923, 382. Burton-in-Lonsdale, 10/6/35, J.W.

#### PHILOPHYLLA HERACLEI (L.) (ACIDIA), The Celery Fly.

A common and generally distributed pest mining the leaves of celery, parsnip and other garden plants. Wild host-plants are various umbellifers, especially *Heracleum* and *Angelica*. There are two or more broods annually (Smith 1931, 231). Some authors separate two-colour forms (*f. centaureae* F. and *f. onopordinis* F.), but intermediates appear to occur frequently.

61. Allerthorpe, 12/8/25, 5, 6, 8, 9/29, W.J.F., *Nat.*, 1930, 87. Frog Hall, 2/5/29, W.J.F. Brighton, 8/6/19, W.J.F. East Cottingham, 29/8/16, W.J.F. Bubwith, 25/7/18, W.J.F. Barmby Moor, 18/5/29, 19/5/29, 23/5/29, 24/5/29, 5/6/29, W.J.F.  
 63. Lofthouse, Roberts, *Topography and Natural History of Lofthouse*, 1885, 138; V.C.H. Farnley, C.A.C. Keighley, Marley, 4/8/37, 31/8/40, J.W. Bingley, St. Ives, 2/6/44, 25/8/45, J.W.

64. Ilkley, 9/9/07, J.H.A., *Bradf. Sc. J.*, **2**, 69. Leeds, Halton, 7/6/26, 6/27, W.J.F.; Oakwood, 6/42, 15/5/43, 17/6/44, 6/45, W.D.H.; Shadwell, 18/6/41, W.D.H. Aberford, 21/6/41, J.W. Askham Bog, 27/5/44, J.W. Hook Moor, 21/6/41, J.W. Crag Wood, Rawdon, C.A.C. Skipton, bred J. A. Fisher. Wistow, Selby, C.A.C.

#### CERAJOCERA MICRO CERAS Hering.

Larvae occur in stems of *Centaurea Scabiosa* L. Introduced as British by Collin (1937, 3). A little known species of which the following appears to be the most northerly record.

63. Kirk Smeaton Crags, 31/7/37, 1♀, J.W. (H.W.A.).

#### TRYPETA (CHAETOSTOMELLA) CYLINDRICA (Desv.) (*onotrophes* Loew, H.).

A very common and widely distributed species. On the wing from mid-May to the end of August according to my observations. Larvae in flower-heads of *Centaurea nigra* L., *Cirsium palustre* (L.) Scop., *Serratula tinctoria* L., and other composites.

61. Allerthorpe Common, 21/6/25, C.A.C.; 30/6/45, W.D.H., *Nat.*, 1945, 143. Skipwith, C.A.C.  
 62. Fyling Hall, 6/28, W.J.F. (J.E.C.); 26/6/29, 1/7/29, W.J.F. Wombledon, 5/8/40, C.A.C.  
 63. Martin Beck Wood, 19/6/20, C.A.C., W.J.F., *Nat.*, 1920, 260. Farnley, C.A.C. Keighley, Holmehouse Wood, 9/6/35, 17/8/36, 27/8/36, 9/8/37, 12/8/37, 6/6/39, 3/6/40, 30/7/41, 9/8/41, 27/6/42, bred 14-21/5/45, 6/8/45, J.W. Hebden Bridge, 29/7/45, W.D.H., *Nat.*, 1945, 146.  
 64. Austwick, 28/6/19, C.A.C., *Nat.*, 1920, 232. Nidd, Mickley, Wistow, Low Bentham, C.A.C. Leeds, Adel, C.A.C.; Roundhay, 10/8/38, W.D.H.; Shadwell, 13/5/42, W.D.H.; Wike, bred from black knapweed, 5/42, 7/8/44 (on wing), W.D.H. Askham Bog, 1/8/42, 24/7/43, W.D.H. Brayton, 6/8/45, common, W.D.H.  
 65. Bishopdale, C.A.C., *Nat.*, 1922, 316. Bedale, C.A.C.

#### TRYPETA FALCATA (Scop.).

Larvae in root-stock of *Tragopogon pratensis* L.

64. Askham Bog, 27/5/44, 1♂, J.W. (W.D.H.).

#### TRYPETA TUSSILAGINIS (F.).

Larvae in seeds of *Arctium Lappa* L. and *A. minus* (Hill) Bernh. A rather widely distributed species on the wing from June to August.

61. Millington, 1/8/36, H.A. Skipwith, 15/6/40, J.W. (H.W.A.), *Nat.*, 1943, 27.  
 62. Clifton Ings, York., 18/7/42, J.W., W.D.H.  
 64. Aberford, 27/7/37, J.W., *Nat.*, 1943, 27. Brayton, Selby, 22-23/6/43, 6/8/45, plentiful on *Arctium*, W.D.H.  
 65. Boroughbridge, north bank River Ure, 14/7/45, W.D.H., *Nat.*, 1945, 144.

#### TRYPETA RUFICAUDA (F.) (? *florescentiae* (L.)).

Larvae in heads of *Cirsium pratense* (Huds.) DC., *arvense* (L.) Scop., and *palustre* (L.) Scop. Adults on the wing from June to August.

61. Melbourne, General Lane, 25/6/19, C.A.C.; 26/6/23, W.J.F. (J.E.C.). Bubwith, 25/6/19, C.A.C., *Nat.*, 1920, 232. Allerthorpe Common, 21/6/25, C.A.C., W.J.F.; 30/6/45, W.D.H., *Nat.*, 1945, 143. Frog Hall, 8/7/29, on *C. palustre* in fields, W.J.F.; 13/7/29, 15/7/29, W.J.F. Skipwith, 7/8/45, W.D.H.  
 62. Wombledon, 5/8/40, C.A.C.  
 63. Farnley, C.A.C. Martin Beck Wood, C.A.C., *Nat.*, 1920, 260. Seckar Woods, 3/7/43, W.D.H.

#### XYPHOSIA MILIARIA (Schrank) (*Oxyphora flava* (Geoffr.)).

Larvae in flower heads of *Cirsium eriophorum* (L.) Scop., *arvense* (L.) Scop., and *palustre* (L.) Scop., also *Arctium Lappa* L. A very common and widely distributed species on the wing from mid-June to August.

61. Melbourne, General Lane, 25/6/19, C.A.C. Bubwith, 25/6/19, C.A.C., *Nat.*, 1920, 232. Allerthorpe Common, 21/6/25, 12/7/28, 11/7/28, W.J.F.;



- 21/6/25, 1/8/36, C.A.C. ; 2/7/27, W.D.H., *Nat.*, 1927, 334. Frog Hall, 4/7/28, 7/7/28, W.J.F. Millington, 1/8/36, H.A. Skipwith, 15/6/40, J.W. Pocklington Canal, 1/7/45, W.D.H., *Nat.*, 1945, 143. Cawood, north bank River Ouse, 12/7/41, C.A.C., *Nat.*, 1941, 248.
62. Buttercrambe, 22/6/35, W.D.H., *Nat.*, 1935, 261. Hovingham, 3-5/8/35, C.A.C., *Nat.*, 1935, 237. Scarborough, 12/6/43, W.D.H., *Nat.*, 1943, 122.
63. Farnley, 26/7/22, C.A.C. Keighley, Royd Lane, 26/6/43 ; Holmehouse Wood, 27/7/40, 12/7/42, 23/7/42, 29/7/43 ; Old Cut River, 26/7/41 ; Riverside, Utley, 25/7/42, J.W.
64. Mickley Woods, 8/21, C.A.C. Nidd, C.A.C. Adel, Leeds, 17/7/21, C.A.C. Aberford, 25/7/36, J.W. Shipley Glen, 2/8/41, J.W. (H.W.A.).
65. Waldendale, 2/8/26, C.A.C.

## PAROXYNA PLANTAGINIS (Hal.).

Larvae in flower heads of *Aster Tripolium* L. and *Limonium vulgare* Mill. Adults on the wing from end of June to August. Very local.

61. Welwick, on *Limonium*, 30/7/33, T.S. (J.E.C.), *Nat.*, 1935, 159. Ousefleet, plentiful on *Aster*, 6/8/34, C.A.C., *Nat.*, 1935, 46. North Ferriby, plentiful on *Aster*, etc., 7/44, C.A.C., *Nat.*, 1944, 151.

## PAROXYNA TESSELLATA (Loew, H.).

Larvae live in flower heads of *Sonchus arvensis* L., *Hypochaeris radicata* L., *Taraxacum*, *Crepis*, and *Leontodon*.

62. Crathorne, 17/7/21, W.J.F. (C.A.C.), *Nat.*, 1931, 123.

## PAROXYNA PARVULA (Loew, H.).

Attached to *Artemisia*. Early records appear under the incorrect name of *Tephritis absinthii* (F.). See Collin (1937).

61. Cawood, 12/7/41, C.A.C., *Nat.*, 1941, 248.
62. Clifton Ings, York, 18/7/42, W.D.H.
63. Keighley, Tip River, 30/9/44, J.W. (W.D.H.).
64. Crag Woods, Rawdon, 28/6/25, C.A.C., *Nat.*, 1926, 54, 85. Brayton, Selby, 6/8/45, W.D.H.
65. Boroughbridge, north bank of River Ure, 27/6/42, C.A.C., *Nat.*, 1943, 27, W.D.H. ; 14/7/45, W.D.H., *Nat.*, 1945, 144.

## OXYNA PARIETINA (L.).

Larvae in stems of *Artemisia vulgaris* L. and *A. Absinthium* L. A rare species.

62. Clifton Ings, York, 6/6/19, W.J.F. (J.E.C.) ; 3/6/23, W.J.F., *Nat.*, 1926, 119 ; 1927, 145.
65. Boroughbridge, north bank of River Ure, 27/6/42, W.D.H.

## SPHENELLA MARGINATA (Fall.).

A widely distributed species occurring as far north as Scotland. Associated with *Senecio aquaticus* Hill., *Jacobaea* L., *vulgaris* L., and other species. Apparently very local in Yorkshire. On the wing from mid-July to late September.

61. Welwick, 30/7/33, on *Limonium*, T.S. (J.E.C.), *Nat.*, 1935, 159.
62. Nunnington, 3/8/40, C.A.C., *Nat.*, 1941, 21.
63. Keighley, Marley, 26/7/37, 8/8/37, 21/9/40, J.W., *Nat.*, 1943, 27.

## ENSINA SONCHI (L.).

Larvae occur in flower heads of *Hypochaeris radicata* L., *Sonchus*, *Leontodon*, *Picris*, *Tragopogon*, and other composites. The adult is usually taken in July and August and is generally rather common. Apparently overlooked in the county.

62. Scarborough, H.J.B., *V.C.H.*
63. Goole, 4/8/34, C.A.C.

## TEPHRITIS VESPERTINA (Loew, H.).

Attached to *Hypochaeris radicata* L. and other composites. Stated to be on the wing from early July to late August. The early and late records given below are therefore curious.

61. Allerthorpe, 25/9/20, C.A.C., *B.A. Handb.*, Hull, 1922 ; 12/8/25, W.J.F. (J.E.C.), *Nat.*, 1926, 119. Frog Hall, 25/8/28, W.J.F. (J.E.C.).

62. Fyling Hall, 6/28, W.J.F. (J.E.C.). Battersby, 6/5/22, W.J.F. Whitby, 10/11/35, H.B. (sr.). Mulgrave Woods, 11/11/35, H.B.
63. Keighley, Holmehouse Wood, 25/11/34, J.W. (H.W.A.).
64. Bolton Woods, 6/19, F. Rhodes. Austwick, 22/8/19, C.A.C., *Nat.*, 1920, 232. Nidd, C.A.C. Mickley, 8/21, C.A.C. Pateley, 26/5/23, C.A.C. (J.E.C.).
65. Bedale, C.A.C.

#### TEPHRITIS BARDANAE (Schrank).

Larvae in the seed capsules of *Arctium Lappa* L. and *A. minus* (Hill) Bernh. Widely distributed as far north as Durham.

63. Keighley, Tip River, 30/9/44, J.W.
64. Bolton Woods, 3/6/39, J.W., *Nat.*, 1943, 27. Smearsett, Austwick, 15/4/42, C.A.C., *Nat.*, 1943, 27.

#### TEPHRITIS CONJUNCTA (Loew, H.) (EUARESTA).

A widely distributed species, but not common. Food plant apparently unknown.

61. Allerthorpe Common, 25/9/20, C.A.C., W.J.F., *B.A. Handb.*, *Hull*, 1922 ; *Nat.*, 1921, 412. Skipwith, 7/8/45, W.D.H.
62. Ramsdale, 7/9/20, W.J.F. Whitby, 16/11/35, H.B.
64. Lawkland Moss, 27/7/33, C.A.C.

#### TEPHRITIS LEONTODONTIS (Deg.).

Widely distributed to Scotland. Larvae in swollen capitulum of *Leontodon autumnalis* L., *L. hispidus* L., and *Chrysanthemum Leucanthemum* L.

62. Gormire, 4/7/26, C.A.C., *Nat.*, 1927, 145. Fyling Hall, 6/28, W.J.F. (C.A.C.), not uncommon on *Cirsium palustre* (L.) Scop.
63. Goole, 4/8/34, C.A.C.
65. Tanfield, 11/5/35, C.A.C.

#### TEPHRITIS RURALIS (Loew, H.).

Larvae in swollen heads of *Hieracium Pilosella* L. and no doubt other species.

61. Allerthorpe, 6/4/28, C.A.C. Pocklington Canal, 1/7/45, W.D.H., *Nat.*, 1945, 143.
62. Battersby, 6/5/22, W.J.F. (J.E.C.), *Nat.*, 1926, 119.
63. Keighley, 21/6/19, R.B., *Nat.*, 1921, 412, recorded as *T. conura* (Loew, H.), but Mr. Cheetham informs me that the specimen which is in his collection belongs to the present species.
64. Pateley, 26/5/23, C.A.C. (J.E.C.), *Nat.*, 1924, 85.

#### TEPHRITIS HYOSCYAMI (L.).

Larvae in flower heads of *Carduus nutans* L. and *C. acanthoides* L. Said to hibernate in Gorse.

64. Bolton Woods, 5/6/37, J.W. (H.W.A.), *Nat.*, 1943, 27 ; 19/6/37, 3/6/38, J.W. (W.D.H.).
65. Boroughbridge, north bank of River Ure, 27/6/42, W.D.H. ; 14/7/45, W.D.H., *Nat.*, 1945, 144.

#### TRUPANEA STELLATA (Fuessl.) (URELLIA).

A pretty species with many food plants, including species of *Anthemis*, *Artemisia*, *Aster*, *Centaurea*, *Crepis*, *Hieracium*, *Inula*, *Matricaria*, *Senecio*, and *Serratula*.

61. Skipwith, 3/9/21, C.A.C., *Nat.*, 1921, 412.
64. Harrogate (presumably), P.I., *Ent.*, 1886, 10. Austwick, 26/7/25, C.A.C. Brayton, Selby, 22/6/43, 6/8/45, believed to have been swept off *Matricaria inodora* L. on both occasions, W.D.H.

#### NOEËTA PUPILLATA (Fall.) (CARPHOTRICHA).

Galls flower heads of *Hieracium* spp. Widely distributed.

62. Scarborough, bred from galls on *H. boreale* Fr., W.F. Raverscar, *H. boreale*, W.F., *Nat.*, 1919, 392 ; *H. umbellatum* L., H.J.B., *Nat.*, 1922, 194.
63. Huddersfield, *H. boreale*, W.F., *H. vulgatum* Fr., W.F., *Nat.*, 1924, 215. Farnley, galls, 9/20, bred in plenty, on *H. boreale*, W.F., *Nat.*, 1920, 324. Keighley, Old Cut River, 10/7/43, 17/7/43, 21/8/41, J.W. (H.W.A.) ;

Tip River, 24/7/37; Riverside, Utley, 25/7/39; Park Wood, 9/8/40, 3/8/40, J.W.

64. Burley-in-Wharfedale, 28/7/93, P.H.G., V.C.H. Leeds, *H. boreale*, W.F., *Nat.*, 1922, 314. Leeds, in centre of city, 11/9/45, W.D.H.

#### DITHRYCA GUTTULARIS (Mg.) (CARPHOTRICA).

Galls at the top of roots of Yarrow, *Achillea Millefolium* L. Widely distributed as far north as Scotland.

63. Huddersfield, galls, Storther Hall, P.I., V.C.H. Lepton, galls, S.L.M., *Nat.*, 1892, 337, V.C.H.

64. Newby Moor, 14/7/28, C.A.C., *Nat.*, 1929, 89, 186.

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### BIOLOGY OF THE 'MILLIONS' FISH, *LEBISTES RETICULATUS* PET.

J. L. CLOUDSLEY-THOMPSON, F.Z.S.

THE 'Millions' Fish or Guppy (so called from one of its many synonyms, *Girardinus guppyi*) [1] is interesting for a number of reasons. Its importance in the control of mosquitos is well known [2, 3], and the hereditary colours of the males (which persist after death) have been used as a basis for genetical experiments [4]. The general hardiness of the fish and its attractive coloration make it popular with aquarists, particularly in the United States [5, 6].

*Lebistes* is a native of Tropical America and the West Indies. In Trinidad, where it is sometimes called the 'Belly-fish' because the females usually have the abdomen distended with young [7], it is found in the three main fresh-water ecological habitats: torrential stream, river, and brackish swamp. In the first its predators are chiefly *Symbranchus marmoratus*, known locally as 'Zangie,' and *Haplochilus harti* ('Small Guabin'); whilst in the rivers it is also preyed on by the 'Guabin' (*Macrodon trahira*) [8].

'Millions' Fish, as the name suggests, are extremely prolific. They are viviparous, one pairing with the male being sufficient to fertilise several broods of young [4]. They can survive extremes of temperature and foulness of water [7, 9]. The ideal temperature is about 25° C., and although they will tolerate 13° C., they congregate in any patch of warmer water, showing pronounced thermotaxis. Below about 12° C. the fish become sluggish, swim with their dorsal and tail fins closed up, and death soon follows. At higher temperatures they are extremely active, and though not speedy, will leap clear of the water to avoid capture.

Guppies are omnivorous, thriving on a varied diet of algae, infusoria, chopped worms, fish, meat (beef, mutton, hare, etc.), egg albumen and bread crumbs as well as the natural diet of insects, larvae, etc. They eat liver with less enthusiasm, in which they are in agreement with other fishes. In this connection it is interesting to note that I once kept a Pond Tortoise (*Emys orbicularis*) which would eat practically any kind of meat except liver, fatty acids possibly being the distasteful components of the tissue.

Under special conditions of oxygen depletion *Lebistes* will come out of water leaving only the tail immersed, but in the natural state, though they feed freely in very shallow water, they are notably careful to avoid being stranded [10]. The dorsal position of the mouth enables them to breathe the surface film so that they suffer no inconvenience when placed in boiled water.

Vision alone accounts for the behaviour of these fishes, not only in sex recognition [11], but also in the surface feeding habit to which the anatomy of the hind

brain is correlated [12]. In captivity they will feed from the bottom. Although Weber's apparatus is absent, they can hear well [12, 13]. Marked colour change is shown in relation to environment; melanophores increase in size and number under the influence of a black background, whilst on a light background guanine is produced, melanophores contract and some are ejected [14]. In a recent experiment a dozen Guppies were placed in an aquarium having a sandy bottom. After a few days all except two had become a light brown colour. One of these was placed in adrenaline solution (1/1000). Within two minutes all the melanophores except those on the head had contracted, and the colour of the fish lightened appreciably. Immersion for twenty seconds in adrenaline 1/200 proved fatal.

Guppies are the most popular, easily obtainable, and important tropical aquarium fishes. They live in ordinary aquaria at room temperature, no heating apparatus being required, and their beautiful coloration and lively disposition are ample recompense for the time spent on their upkeep.

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#### FIELD NOTE

**Bryological Notes from the Halifax District.**—A record for the Hepatic *Fossombronina Wondraczeki* (Corda) Dum. for V.C. 63 can now be added to 61 and 62 given in the recently published *Transactions*. The more common *F. pusilla* is fairly well distributed about Halifax, although previous to 1944 the only recorded position was for Todmorden. In marshy pastures with a clay subsoil, the cattle often bare the clay and *F. pusilla* is one of the first plants to appear on the bared surface, also on the edge of the pasture if it happens to border a stream. In one of these latter positions in the lower part of Wood Hey Clough between Mytholmroyd and Hebden Bridge I collected a *Fossombronina* with ripe capsules in October, 1945, and the spores on examination proved it to be *F. Wondraczeki*. Both species occurred in the same pasture. Dr. W. Watson has kindly confirmed the record.

Many of the Bryophytes recorded under the name of Bolton in Watson's *History of Halifax*, (1775), had up to the publication of the *Flora of Halifax*, (W. B. Crump and C. Crossland, 1904, not again been met with. A small proportion of these lost records were for calciphilous plants which on the Grits and Lower Coal Measures that constitute the geology of the area can have only a restricted distribution. One of these old records for the moss *Weisia verticillata* was the subject of a note in *The Naturalist*, 1945, when it was found at Cragg Vale, and it has since been found in small amount in other parts of the district.

Recently investigating an unusual outcrop of a sandstone with a lime content sufficient to influence the vegetation, that occurs in Eaves Wood, Heptonstall, I met with *Madotheca platyphylla* (L.) Dum., an Hepatic recorded in the *Halifax Flora* as *Porella platyphylla* Lindb., 1775, Bolton. This is stated in MacVicar's *Hepatics* to be frequent in limestone districts but not confined to them. Whether this is the site of the old record is conjectural as no localities are given for the Bolton records. The unusual nature of the outcrop was known to earlier local botanists in 1834; R. Leyland recorded the grass *Melica nutans*, and old records indicate the presence of *Convallaria majalis*, *Rubus saxatilis*, *Asplenium rutamuraria*, *A. Trichomanes*, and the moss *Neckera crispa*; of these the two last named still persist.—H. WALSH.



## ANTS AND MEN

W. LAWRENCE SCHROEDER, M.A.

FROM time immemorial, ants and their ways have challenged the curiosity of man. In the third or fourth century B.C., Agur the son of Jakeh included ants among the four things 'little upon the earth' but 'exceeding wise'; for though a 'people not strong' yet they wisely 'provide their meat in the summer.' And it may have been Solomon, that exemplar of wisdom, who suggested to those upon whom he pulled when they ought to be up and about, that a useful lesson might be learnt from the ant, who, wise in her day and generation, provides against the evil day of famine, by gathering 'her food in the harvest.' Contemplative man is fascinated by the busyness of an ant heap, and by the apparent purposiveness of the workers in their transport of pupae from place to place; and throughout the generations there have not been wanting those for whom the ant has been an index to higher truths touching the values and meanings of human society.

Dr. Caryl P. Haskins' book *Of Ants and Men*\* is but the latest in a long series of works dealing with the assumed parallel developments of social elements in the insect world and in human society. The *Hymenoptera*—inclusive of bees, wasps and ants, and the *Isoptera*—the order to which the termites or white ants belong—have commanded, in ever-increasing intensity, the attention of naturalists, largely on the ground of the social problems the various phases of their community existence embody. Part of the charm of Dr. Haskins' fascinating treatise is in the thorough-going attempt to correlate the happenings observable in the many different kinds of ant community life, with what may here and now be seen in a world where contrasting motives and ideals are evidence both of the solidarity of human existence, and of the differences that divide nation from nation, and race from race—differences largely distinctive of social progress and development. In truth, the book is a somewhat sermonic embodiment of the proverbialist's injunction 'Go to the ant, O man, consider her ways and be wise.'

Straightway let it be said that there is nothing exceptionally new in the factual element of the book; other observers have noted many of the activities which give meaning to the various chapters. The significant thing is the emphasis on the parallels suggested by the social lives of men and of ants, and the indication of a possibly deeper and more fundamental relation than we ordinarily admit. That the author is aware of the risks of his undertaking is clear from a reference to 'the criminal error of hopeless anthropomorphism'; and when at times we think it reasonable to believe that he is forgetting the critical principles he has adopted, he reminds us of the danger of assuming that for the ant there is 'a consciousness and a thought pattern similar to our own.' Nothing, he adds, would be more erroneous, in that there is 'not the slightest justification' for such an assumption. Julian Huxley in his very delightful book on ants, referring to the comparisons made between human society and the various communities of insect life, and the theories of the State built thereon, is more uncompromisingly critical of such analogical findings: for 'almost without exception,' he writes, the moral has been false, the analogy misleadingly used, for there are 'radical differences between social insects and social man.' And now to Haskins.

Fifty million years ago, the social life of ants had almost ceased evolving, and their final physical form was almost fixed. There are fossil forms that can be assigned to present-day genera: a winged ant in Baltic Amber about 30 million years old is essentially like ants of to-day. The *Hymenoptera* of *Mesozoic* times, over fifty million years ago, were solitary forms, apparently derived from cockroach-like primitive insects. From parasitic members of the order, it is claimed, the ants, bees and solitary and social wasps descended. Gradually among the ants there was a transition to a sub-social stage of life, and the evolution of a definite maternal care. The mother-ant became the overlapping element in the structure of the society; and with her longevity, the dependence on her of the brood increased. For reasons unknown there was among the female progeny a definite physical degeneration—diminished size, lessened fertility and loss of wings. 'This semisocial Scoliid group represents the very beginning of the true

\* Of *Ants and Men* by Dr. Caryl P. Haskins. Pp. viii + 244 with 15 plates. George Allen and Unwin, Ltd. 12/6.

ants.' From an adequate survey of the coming of the ant, Dr. Haskins passes to a consideration of the ants of to-day, with their varied ways of securing a living, of arranging their lives, of perpetuating the community and of preserving the typical elements thereof. Of the various kinds of ant, the *Formicine* excels 'in the degree of its plasticity'; for in the group there are representatives of the various cultural stages ants have reached. Most primitive are the hunting ants; pastoral and agricultural stages are represented; gall-dwellers are found, and silk-building ants of the genus *Ecophylla*; and among the higher *Formicines*, there are slave-keeping species, and also ants with a more liberal outlook touching the possible virtues of individuals not 'of their class'; such liberality sometimes resulting in the fusion of colonies and the pooling of the food reserves.

Definite social excellences are given in the care of the *Formicine* young, and in the adjusting of the delicate relations of individuals, who may during life assume a number of rôles within the colony, caring for the brood, foraging for food, and it may be, partially usurping the functions of the queen.

It is the author's contention that ant societies offer criteria of human lives, not obtainable from a study of mankind; but I am not sure that we can speak of 'the consanguinity of ants and men as a very, very ancient one'; for consanguinity implies blood relationship. Dr. Haskins admits the absurdity of thinking that there is any 'direct genetic connection between their habit patterns,' but at times he would almost have us believe there was, so closely does he approximate the parallels analogically.

Ants like men—he contends—are the most adaptive organisms of their group and the most dominant. As in human society, the most dangerous of ant-enemies are those of their own kind. As with men, the ant manifests a marvellous adaptability to environment, for their nests show great variability within a single species. As in the case of man, the ant brain has become highly developed at the expense of the sense organs in general. We see not as does the eagle, but we can gather greater meaning from what we *do* see. But there is one important development phase, in which man has the decided advantage:—among ants, the evolution of brain has been mainly confined to females; males are a poor lot, mere cogs in the reproduction machine. But among humans there is no outrageous denial of brain, that is mental power, to the males of the species; and so there is a very definite possibility of co-operation on the higher levels of art, science, philosophy and religion. Among ant communities the real direction of life along the agelong patterns of behaviour is given by the queen and the female workers.

Dr. Haskins sets out, in some detail, the resemblances and differences manifested by ants and men in their anatomy, physiology and psychology; but he is careful to affirm that as individuals the differences between them are overwhelmingly great; it is only the ant society, as such, that offers a 'criterion' of the background of the guiding forces which have moulded the complex basis of our own social structure.'

The author's account of the internal activities of the nest is most interesting. Both sexes are winged, but the male 'always asocial' and essentially parasitic, contributes little to the economical well-being of the colony. The workers are the responsible element; it is they who determine the day on which the marriage flight will take place; the young queens may mate with several males successively: the latter, after a brief period, perish. The fertile females dislodge their wings from the sockets; and each, after a short rest, seeks shelter. A burrow is excavated in the earth, and a small chamber formed, within which—for about a month—the queen remains, while certain physiological changes are taking place. Egg-laying begins: the first small generation of larvæ is carefully attended by the mother; the food being the saliva which contains the fat products of the degenerated thoracic muscles. According to the season and the weather, there may be hibernation of the queen and the larval brood; with warmer weather the pupæ are helped to emerge as tiny workers, and the first family is established. Soon they become restless, and finally break through to the light of day, and begin foraging for food which they dutifully serve to the one by whose maternal care they have survived. Successive lines of workers increase in number and size, fulfilling their function; finally, the queen becomes a mere egg-laying member of the community, being fed by the workers with regurgitated, probably predigested, food. Depending upon the polymorphism of the species, soldiers and larger workers appear; and after a time—it may be several years—young queens and males are born, and the

possibilities of new colonies are thereby given. The old queen continues her specific activity until the sperms received on her marriage flight are exhausted. In the fullness of time, the queen dies, the workers age and the colony disintegrate—the decline and fall of an empire.

Different ant genera show variations in the evolution of the colony; but Dr. Haskins has little difficulty in establishing the similarity of the motives which operate in the fashioning of the human and ant societies—the fundamental one being the promotion of the individual's welfare and security, inclusive of action against the possibilities of famine. He notes the influence of what he calls 'social pressure,' in the moulding of individual initiative, and the fashioning of ambition, but these must serve the good of the society as a whole. Perversion, as in human society, is not unknown in the various communities of ants; and perversion means ultimate destruction.

It is tempting to set out at length the various bodies of fact which are made to serve the purpose of Dr. Haskins' book—so fascinating are they in their own right, and so strangely suggestive of the bewildering ways of mankind. But I must not strain to breaking point the editor's patience, for there are certain phases of the subject which call for critical comment. There are adequate descriptions of the activities of the fungus-growing ants, the honey-ants—those quaint store-chests of communal food—and the harvesting ants. There is a detailed account of the slave-making ants, of tributary ants, with references to parasites within and without the ant community proper; and there is a chapter dealing with the development of totalitarianism—with the heading 'Fascism or Communism'—upon which the politically minded reader may nurture his aspirations or expend his condemnation—being pleased, or annoyed, that the lowly ant has anticipated him in the evolution of social solidarity, and indicated the trends along which modern human society seems to be moving. The old idea of man's superior aloofness from the 'lower creation,' has given way to the deeper truth of the close relationship of all life. But that is not to say that human society is a 'multicellular organism,' and that the ant community may be so regarded. Dr. Haskins' chapter on that phase of his subject is the least convincing in the book.

Criticism begins in the attempt to understand the philosophic basis of Dr. Haskins' method. The scientific worker or naturalist may set himself to examine or establish what is *given* in Nature—what is *there*.

The main contribution to his idea of an object is given in sense data; and the value of these will be determined by his physical and physiological equipment. It is obvious that a study of bird-song is conditioned by the health and excellence of the naturalist's auditory apparatus; and that the success of a floral delineation will depend fundamentally on the individual's power of vision. E. M. Nelson, the distinguished microscopist, could discern the markings on certain diatoms where other workers failed. Instruments of course extend natural powers, so that there is a more delicate appreciation of 'what is there'; but at bottom the sensory apparatus of the scientific worker is the essential thing.

Findings are expressed in words and other symbols, so that there may be a traffic of ideas, the communication of knowledge from mind to mind, and the establishment of what we call the 'truth' of an object. But the 'truth' is for *us*, and not for the object; the symbols of the physicist are for *him*, and not necessarily for the thing symbolised.

This so-called objective method of science can only be relatively correct: but the degree of correctness is intensified by the like experiences of many observers.

We need not dispute the correctness of the bodies of fact collected by himself and many other workers, and given in Dr. Haskins' book; but we can legitimately question the method by which these factual bodies are interpreted in terms of human behaviour. Men and nations find it difficult to understand each other, despite the possession of adequate intellectual symbols. How much more difficult is it to understand the relations of the lower animals to ourselves and to each other. It may be that the fireside cat is genuinely devoted to us—a loving dependent of the household: but who knows? the devotion—so apparently touching—may be but cupboard love.

It is, of course, of interest to run human experience alongside lines of sub-human natural development—to talk, as does Grant Allen, of plants marrying and rearing families, and of their 'clubbing' together; but it borders the absurd to talk about their 'marriage customs,' as if there had been deliberate agreement



to establish specific ways of reproduction. So also Tickner Edwardes in *The Love of the Honey Bee* interprets the action of the queen bee in her slaughter of captive queens, as a royal sacrifice, when the queen giving over for the moment her nursery-work 'flies to the slaughter, tearing down the prison doors and putting each clamorous captive fiercely to the sword.' The imaginative touch does not hinder our appreciation of the scientific fact.

I think it permissible to interpret any phase of life, in terms of any other—that is the way of the poet and of the artistic imagination. Maeterlinck and Fabre handle phases of natural life in an artistic and imaginative fashion; but there is no claim that their settings-out are exhaustively scientific—charming as they are as narrative.

The valid approach to the study of ants may be either physical—in terms of measurement and sense data; or sociological—in terms of relationship; or psychological—in terms of mental behaviour. Dr. Haskins employs the three methods; but it does seem as if the imaginative treatment of the scientific data rather over-balances the coldly objective handling of his material. No one denies the ant the possession of mind. But that is not to say that the quality and power of the mind are rightly comparable with those of a human being; for ant behaviour may issue from different motives than may actuate similar behaviour among humans. At the best, we can but guess at the origin of conduct—human or otherwise; the 'why' of things is often beyond us.

But this we can say, touching the subject under review, that the attribution of 'intellect' to the worker ant cannot properly be sustained if by 'intellect' we mean the power of reasoning on the merits of a given situation, of comparing possibilities of specific activities, and of weighing the relative values of things given—all of which are understood as the function of the human intellect.

*Of Ants and Men* is delightfully written—stimulating to the imagination, vastly informative, and a joy to possess. Dr. Haskins is to be congratulated on the attractive manner of his exposition of the wisdom of one of the least of things.

## REVIEWS AND BOOK NOTICES

**Butterflies and Moths in Britain**, by Vere Temple. Pp. viii+120, with 10 plates in colour, 57 drawings and 95 photographs. Batsford, 12/6. This book forms a companion volume to the trio of works on Wild Animals, Birds and Flowers in Britain, all of which have reached their second edition. The treatment of the butterflies is based on habitat with chapters on forest, fen, downland, hedgerow and woodland species. For the moths, exclusive of the microlepidoptera which are omitted, a sequence based on classification is employed. Miss Temple writes with enthusiasm about the insects which she describes, and includes interesting and up-to-date information on colour vision and courtship in butterflies, 'drumming,' scent organs and smell. The descriptions of life histories and habits also include frequent and careful personal observations, though references to distribution would suggest that this is based mainly on field work in the south of England. Northern lepidopterists would certainly not agree that the Red Underwing Moth, for example, is common everywhere. Miss Temple is also a gifted artist and has contributed all the admirable drawings in the text as well as those from which the colour plates have been prepared. The quality of the photographs is fully up to the high standard we associate with a Batsford book and a valuable feature is the inclusion of a series showing magnified eggs. It is a safe assumption that this profusely and beautifully illustrated volume will be as popular as the other works in the same series.

**Insects, Birds, Beasts and Humans**, by James Herne. Pp. 99 with 13 photographic illustrations. Epworth Press, London, 5/-. The author of this little book is evidently a great lover of the country, a keen and sympathetic observer interested in all aspects of wild life and concerned for its protection and preservation. He disclaims the title of naturalist and frankly sets out 'not to instruct, but rather to entertain.' The result is a slight but pleasantly written collection of short essays on natural history observations, experiences and reflections designed for the nature lover and observant Rambler rather than the naturalist.



## ELIHU BERRY—A LITTLE KNOWN YORKSHIRE BOTANIST

E. G. BAYFORD, F.R.E.S.

THE recent article by Dr. Watson on John Bohler serves as a reminder that there are other botanists of whom little but the name is known. Of those connected with the West Riding the name of Elihu Berry ought not to be allowed to sink into oblivion.

He was born at Darton, near Barnsley, on September 3rd, 1812. John Hugh Burland, in his *Annals of Barnsley and its Environs* (in four MS. volumes completed about 1875), says that a copy of Culpepper's *Herbal* came into his possession, 'which led him to study Botany in which science he became proficient.' In November, 1838, he wrote for *The Floricultural Magazine* a short note 'on the cultivation of Hoyas,' and if I am not mistaken an anonymous article in the same magazine for November and December, 1840, is by him. This is entitled a 'Gardening Tour, with remarks made at the various places, by a Practical Gardener.' In this are described visits to the gardens at Wortley and Wentworth Woodhouse as well as the Botanical Gardens at Sheffield where Robert Marnock, the editor of *The Floricultural Magazine*, was curator. Berry had recently severed his connection with Noblethorp, near Silkston, at the gardens of which he had been for fourteen years.

His next situation was as gardener at Park House, Ardsley, near Barnsley. Burland gives these places in reverse order, Park House and Noblethorp, and continues, 'While at Park House he contributed some papers to *The Phytologist* on the plants to be found in the neighbourhood of Barnsley. The Vale of the Dearne below Monk-Bretton Priory was a favourite resort which he called "the happy valley." ' This we may well believe it to have been, for in those days it had been little, if at all, disturbed by any of man's activities other than the grazing of cattle. I am old enough to remember the beginning of the progressive spoliation of this lovely valley by the purchase of a large tract of land from Colonel Wombwell by the Corporation of Barnsley for the purpose of a sewage farm. This resulted in the stoppage of the footpath on the left bank of the river from Burton Grange to Sunny Bank Wood, for until then there was a footpath on each side of the Dearne. Then came the two railways (I do not include the Midland Railway, which barely touches the area and was much earlier) which wiped out Scolah Wood, one of the localities particularly named by Berry. Later still came the Ardsley Sewage Farm, now, since the incorporation of Ardsley in the Barnsley County Borough, disused. This, coming quite close to the footpath, often made the air so pestilential that one gave a gasp of relief when it was left behind and a less aromatic region gained. Yet I recall that at an election meeting held in one of our local schools a prominent councillor and later Mayor said in my hearing that he much preferred a visit to the sewage farm to one to Locke Park. *De gustibus non disputandum*, or, as we have it, 'There is no accounting for taste.' The rest may be added by those who know it. Notwithstanding these inroads and the cutting down of much of the fine timber in Athersley, Horse Carr, and Sunny Bank Woods, there yet remains much that is pleasing to the naturalist and lover of rural quietude, and which helps to recall the loveliness it possessed in Berry's time a hundred years ago. Burland tells us that Berry 'was an extensive reader and quoted the poets from memory. His recollection of historical dates was extraordinary. These accomplishments brought him a large circle of friends.'

He married Mary Burgoyne, of Sheffield, at Sheffield Parish Church on Sunday, July 12th, 1840, and died in Dublin on October 22nd, 1869. He left behind him a diary written in shorthand: one wonders where it is now, if, indeed, it is still in existence. During his residence in the Barnsley district he often acted as judge at flower shows in the neighbourhood. Although Burland states that he wrote 'some papers' in *The Phytologist*, I cannot find more than one in January, 1849 (iii, 386) dated from 'Park House, Barnsley, Yorks., November 13th, 1848.' 'List of the rarer plants growing near Doncaster and Huddersfield.' This is a continuation of two articles by Peter Inchbald, formerly of Doncaster, but then of Storthes Hall, near Huddersfield, entitled (1) 'Record of some of our Rarer Plants growing in the valley of the Don between Doncaster and Conisborough Castle,' (2) 'Record of the more uncommon of the Plants growing in the neighbourhood of Huddersfield.' These appear in the number for November, 1848.

Strange to say, Dr. F. A. Lees, in the Bibliography prefixed to *The Flora of West Yorkshire* (1888), makes no mention of these two papers, although he includes

a later one by the same author, 'Record of the rarer Plants occurring in the neighbourhood of Adwick four miles north of Doncaster.' Even here he changes the title to 'Some Adwick-le-Street and Doncaster plants.' Elihu Berry's paper is listed, with its title unaltered, though there would have been sufficient justification for Dr. Lees to alter it in accordance with Berry's introductory statement: 'In your November number of *The Phytologist* there are two articles treating of the distribution of the rare plants growing in the neighbourhood of Doncaster and Huddersfield; in continuation I beg leave to forward for your insertion in the next number some of the plants growing about Barnsley, a locality mid-way between the two places.'

In the museum of the Barnsley Naturalists' Society are a number of plants collected and preserved by Berry as well as many others received from abroad, more particularly from North America and Australasia, proving him to have been an ardent collector with a wide range of correspondence.

The following are some of the plants he records, with the localities where he found them.

- Anemone nemorosa*. Wood Anemone. Dearne Bank.  
*Ranunculus hederaceus*. Ivy-leaved Crowfoot. White Cross Wood. (White Cross Wood is now non-existent. A housing estate covers the site.)  
*Castalia alba*. White Water-lily. Dearne, two miles below Barnsley.  
*Corydalis claviculata*. Climbing Fumitory. Eyming Wood. (This is given as 'Mottram Wood' in *The Phytologist* list, and was so-called because the woodman's name was Mottram, but both names refer to the same locality. It was once a pleasant resort but no longer exists.)  
*Viola odorata*. Sweet Violet. Monk-Bretton Priory, Yews Farm, near Wombwell.  
*Linum angustifolium*. Narrow-leaved Flax. Near Ardsley. (A casual, no doubt. In Berry's time flax was still being grown in Barnsley and the villages round about, and this may have been introduced with its sister species.)  
*Anthyllus Vulneraria*. Lady's Fingers. Canal bank, near Oaks Farm.  
*Ornithopus pinnatus*. Jointed Bird's Foot. Canal bank, near Oaks Farm. (Another casual if correctly identified. Lees makes the suggestion in the Appendix to the *Flora of West Yorkshire*, p. 785, that it may, like Roberts' Lofthouse plant, have been *O. scorpioides* Willd.)  
*Vicia hirsuta*. Hairy Tare. Ardsley Oaks.  
*Poterium Sanguisorba*. Lesser Burnet. Dearne meadows below Barnsley.  
*Circaea lutetiana*. Enchanter's Nightshade. Dearne meadows, below Barnsley.  
*Sanicula europaea*. Wood Sanicle. Coppice, Pogmoor.  
*Apium graveolens*. Wild Celery. Grange Lane.  
*Aegopodium Podagraria*. Gout Weed. Dearne side below Monk-Bretton.  
*Oenanthe crocata*. Hemlock Dropwort. Darfield.  
*O. Phellandrium*. Water Dropwort. Pool by Cliff Road.  
*Adoxa moschatellina*. Moschatel. Scorah Wood, Ardsley.  
*Valeriana officinalis*. Valerian. Scorah Wood, Ardsley.  
*Inula squarrosa*. Ploughman's Spikenard. Field by Smithy Wood. (This wood is now non-existent.)  
*Chrysanthemum segetum*. Corn Marigold. One mile north of Barnsley.  
*Centaurea Cyanus*. Cornflower. Field in Burton Bank.  
*Scutellaria galericulata*. Common Skullcap. Canal banks; Ardsley.  
*Lamium Galeobdolon*. Yellow Archangel. Day house plantation.  
*Plantago Coronopus*. Buck's-horn Plantain. 'On Nesbro hill plentifully' = Measborough hill.  
*Sagittaria sagittifolia*. Arrowhead. Canal, Ardsley, plentifully.  
*Potamogeton perfoliatus*. Pondweed. Canal, Ardsley, plentifully.  
*Iris Pseudacorus*. Yellow Flag. Scorah Wood.  
*Carex Pseudo-cyperus*. Storr's Mill Dam.  
*C. pallescens*. Storr's Mill Dam. (Both mill and dam are gone.)

Some of these localities remain but are of little value as collecting grounds; some have gone altogether. Of the plants recorded many may yet be found, but one must go farther afield to find them. The White Water-lily, for instance, is nowhere to be found in our immediate district, and it is due to Elihu Berry that we know it once was so near to Barnsley.

## ORNITHOLOGICAL REPORT FOR NORTHUMBERLAND AND DURHAM FOR 1945

Compiled from the records of members of the Ornithological Section of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne and other observers, by GEORGE W. TEMPERLEY, M.B.O.U.

(A key to the initials appearing in this Report will be found at the end of these notes. Abbreviations: N.=Northumberland; D.=Durham; B.B.=*British Birds*.)

The use of the numbers with the English names employed in Witherby's *Handbook of British Birds* has been adopted to save the space of printing the scientific names.

Where reports are placed in square brackets it is implied that, being sight records only, some slight element of doubt exists as to the accuracy of the identification. Such reports are included for the information and guidance of other observers who might be able to verify the records.

The number of observers contributing notes to these reports has now reached a total of 72. Owing to the abridgement of the Report for publication in *The Naturalist* many interesting notes have had to be omitted, but every note helps the compiler to obtain a more extended view of the bird life of the two counties, on the basis of which this Report is constructed.

It would greatly help the compiler if observers would (1) keep notes for the two counties separate, (2) arrange notes as far as possible in the order in which they appear in this Report, (3) write on one side of the paper only, (4) avoid, if possible, including a record in the middle of a lengthy letter relating to other matters.

The compiler will gladly welcome notes from new observers. These should be sent to George W. Temperley, Hancock Museum, Newcastle upon Tyne.)

EVENTS having a notable influence on the bird life of the two counties have been the reopening of the coast-line to the public and the return of the 'watchers' to the Farne Islands. Owing to the absence of the shore-shooter during the years of war, the number of duck and other water-fowl close inshore and of waders visiting the rocks and beaches, particularly of South Northumberland and Durham, increased considerably, and birds were seen along stretches of coast from which normally they had been absent. For instance, at Cullercoats, Oystercatchers, Godwits, and Sanderlings were frequently noted; but since the opening of the beaches these have kept away (G.R.L.). The results of the renewed protection on the Farnes is reported below under the species concerned.

This year's report has benefitted from notes sent in by a chain of observers from various points along the coast: R.D.S. at Teesmouth, J.R.C. at Sunderland, F.G.G. at South Shields, H.T. at Alnmouth, and F.B. at Berwick. Their united records give a detailed picture of the bird life of the coast throughout the year. As a result, interesting and uncommon visitors have been reported, such as the Surf Scoter and Kentish Plover in Northumberland and the Iceland Gull and Pomatorhine Skua in Durham.

Other items of special interest are the first breeding of the Siskin in Northumberland (1942), the occurrence of a Snowy Owl (1942), and the finding of an egg of the Manx Shearwater on Marsden Rock, D. (1939).

### CLASSIFIED NOTES

1. RAVEN.—In Upper Teesdale two nests were built and eggs laid, but both were destroyed (H.W.). A pair bred successfully at a site in Northumberland which had been untenanted for some years (B.P.H.). A pair reared four young on the moors south-east of Chillingham (J.M.C.).

2. HOODED CROW.—Scarce at the beginning and end of the year, only odd birds being reported from Teesmouth (R.D.S.), Darlington Sewage Farm (J.R.C.), Gosforth Park (J.R.C.), and Alnmouth (H.T.). The largest flock recorded was from near Cresswell, N., where seven birds were seen on February 8th (S.E.C.).

3. CARRION-CROW.—On November 20th, 66 were counted at Darlington Sewage Farm, D., accompanied by two Hooded Crows (J.R.C.). A large winter roost was established at Gosforth Park, N. On October 14th 10 were seen roosting



together in one tree (R. and A.). On November 13th, at dusk, no less than 125 birds were seen to arrive, with one Hooded Crow amongst them. On subsequent evenings counts of 75, 72, and 70 birds were made, while on December 6th 142 were present (J.R.C.).

4. **ROOK.**—A census of rookeries was taken over an area of 103 sq. miles in the neighbourhood of Darlington; 5,122 occupied nests were counted, or 50 to the sq. mile (J.B.N.). In South Northumberland a census was taken over an area of 37 sq. miles. The nine rookeries within the area were found to contain a total of 1,778 nests, which gives an average of 48 breeding pairs per sq. mile (R. and A.). Another census was taken in the neighbourhood of Berwick-on-Tweed over an area of 87 sq. miles extending on both sides of the Border. Sixty-two rookeries were found containing approximately 7,000 nests, which gives an average of 87 breeding pairs per sq. mile. Out of 5,660 nests, 24 per cent. were in elm trees, 22 per cent. in ash, 17 per cent. in pine, 14 per cent. in sycamore, 14 per cent. in beech, 4 per cent. in oak, 2 per cent. in chestnut, and 1 per cent. or less in spruce, hawthorn, elder and birch. In one locality 40 nests were in a hawthorn hedge 10 ft. to 13 ft. in height and in another 30 nests were only 10 to 14 ft. high in elder bushes. Building began about February 26th, most nests were completed by mid-March, but some building was in progress till mid-April. Egg-laying was general about mid-March and most of the young were fledged by the end of April. On September 15th 1,000, mainly young birds, were feeding on Budle Bay mud-flats and 500 on Fenham Flats, where juveniles outnumbered adults by 40 to 1 (F.B.).

5. **JACKDAW.**—A pure white bird of the year was seen on several occasions at Allendale, N., in July (R. and A.).

7. **MAGPIE.**—Still increasing in numbers in many parts of the two counties; but 'by no means common' in the Berwick area (F.B.). On January 17th, fourteen were seen in a flock near Crookfoot Reservoir, D. (R.D.S.).

11. **BRITISH JAY.**—Two nestlings ringed at Blagdon, N. on June 20th, 1944, were recovered where ringed on January 4th and 20th, 1945 (R. and A.).

14. **STARLING.**—During the autumn a flock of from 200 to 300 birds roosted nightly in the reeds at Gosforth Park Lake (R. and A.).

20. **BRITISH GOLDFINCH.**—Odd birds, pairs and small flocks are met with regularly about Berwick (F.B.). A 'charm' of 12 near Bamburgh, N. (P.L.H.). 'Not noted near Alnwick' (J.E.R.). Bred near Humshaugh again (P.G.W.). Not uncommon in summer about Haydon Bridge and Fourstones, N., where they breed (W.J.). December 28th, three at Crag Lough, N., on knapweed (J.R.C.). Also reported from South-east Durham.

21. **SISKIN.**—We have received the following note on the breeding of a pair of Siskins near Wooley Sanatorium, South of Dipton Wood, N. in the summer of 1942. It is communicated by Dr. A. Scott of the City of Leicester Health Department, who, at that time, was resident Medical Officer at Wooley Sanatorium. —'The parent birds appeared in 1942, and I saw them on numerous occasions in and near my own garden, the cock more frequently than the hen, which was presumably sitting. I do not know where they nested, but I should say almost certainly in the small wood abutting on the back of the garden of the house. They certainly raised a brood, as I saw the parents with four or five fledglings on at least three occasions; once getting within three or four yards of the nearest youngster, which was also about the nearest I ever got to the cock. When they first arrived I had a good look through x6 glasses at about 20 yards range to make sure what they were, but did not have the glasses on them again. They did not appear in any of the three following seasons to my knowledge. I know the Siskin quite well, both as a wild bird in my native parts, where I have more than once, in my boyhood, found a nest; but also as a cage bird, as my father had a cock for several years when I was about 10 or 14 years old, so I do not think that there is any possibility of error in my identification.'

This is the first record of the breeding of the Siskin in Northumberland, though breeding has been suspected on more than one occasion. There are one or two records of its nesting in Durham and Cumberland.

23. **MEALY REDPOLL.**—'In a party of 50 or so birds which haunted some linseed stubble on Hole Row Farm, Consett, during the first week in December, were several of this species amongst Chaffinches, Greenfinches and Yellowhammers. On December 20th a party of thirteen was of this species' (E.M.). On November



19th a single bird was observed beside the fish-pond near East Boldon Station, D. (J.R.C.).

John Hancock gave the status of the Mealy Redpoll as—'A common winter visitant, occasionally appearing in large flocks'; but this is the first report of the species that we have received from either county during the period in which these Ornithological Reports have been issued (1933-1945).

26-27. HORNE-MANN'S REDPOLL. Sub-species not determined. On November 10th at Hallington Reservoir, N., two very pale Redpolls were seen feeding on the tops of thistles. Viewed at close range it was quite possible to see clearly their pure white unstreaked rumps, broad white wing-bars and very pale breasts without red colouring. One bird was markedly whiter than the other, the only colouring on its head when viewed full-face, was the dark red patch on the forehead and the black bib under the bill, for the crown, cheeks and upper breast were almost pure white in comparison. They were without doubt *Carduelis hornemanni*, probably of the western race, *C.h. hornemanni* (Holb.). They appeared to be too large for the eastern race, *C.h. exilipes* (Coes), but it was impossible to be quite certain of this in the field (G.W.T. and T.F.H.).

The first British record for Hornemann's Redpoll was a specimen obtained at Whitburn, D. on April 24th, 1855, recorded by Hancock and now in the Hancock Museum. George Bolam referred to very pale Redpolls seen by him in Northumberland which he considered to have been of this species (*Trans. N.H.S.*, Vol. VIII, p. 12).

36. COMMON CROSSBILL.—At least one pair of Crossbills bred successfully in Northumberland. On March 10th and 11th, Crossbills were observed in Dipton Wood. On the latter date a pair was present and was seen to be carrying nesting material into a pine tree. On April 18th a nest containing two nearly fledged young was found in the tree. On the 20th the birds had flown (T.F.H., T.C. and G.W.T.). On April 19th, a single bird was seen singing on an ash tree near Dukesfield, Slaley, N. (R.G.). On the 27th a small flock of about nine birds was seen and heard near the same place (T.C.). Birds were seen in Upper Teesdale in February and March and also in October, November and December; but no nests were found (H.W.).

41. BRITISH CHAFFINCH.—A young bird, ringed as a nestling at Gosforth Park on May 18th, 1945, was recovered at Benton on June 30th of the same year (R. and A.).

42. BRAMBLING.—Very few indeed were reported in the autumn of 1945. This coincides with a very meagre crop of beechmast.

43. CORN-BUNTING.—On February 8th a flock of 40 was seen near Ellington, Cresswell, N. (S.E.C.).

[50. ORTOLAN BUNTING.—On November 17th, in a hawthorn hedge adjoining Fenham Flats, N., a bird uttering an unusual note attracted attention. On a close and detailed examination it was judged to be an Ortolan Bunting in first winter plumage. Its mantle was chestnut brown, breast yellowish buff and streaked, belly of the same colour with fewer streaks. Its most prominent markings were its long yellow moustachial streaks, curving round the ear-coverts, and its yellow chin. It had a very pale bill. It was about the same size as a Yellow Bunting, but shorter in the tail. It uttered a loud, rapid and frequent call of 'teeu' (F.B.). There is no previous record of the Ortolan Bunting in Northumberland, but it has occurred elsewhere on the East Coast. Immature birds could very easily be over-looked.]

59. SNOW-BUNTING.—As in the previous winter, very few have been reported during the winter of 1945. On February 26th six were seen on the Seaton Carew Golf Course, D. (R.D.S.). First seen in autumn at Teesmouth on October 16th, a pair (R.D.S.).

62. TREE-SPARROW.—On April 13th a flock of about 35 were seen roosting together in a hawthorn hedge near Blagdon, N. (R. and A.). A pair bred near Alnmouth, N. (H.T.). Few and local near Berwick (F.B.).

81. ROCK-PIBIT.—During April and May at least three pairs were observed on the Durham coast under conditions which showed that they were breeding or attempting to do so (H.M.S.B.).

88. YELLOW WAGTAIL.—First seen April 14th, Teesmouth (J.R.C.). April 15th, Upper Teesdale (H.W.). Last seen, one, Holy Island, September 18th (H.T.).

90. **PIED WAGTAIL**.—In the late winter and early spring of 1944-45, forty or more congregated nightly to roost in the reeds at Gosforth Park Lake (R. and A.). During December, 1945, a flock of at least 50 roosted in a bed of reeds on East Lilburn Farm, N. (J.M.C.). On April 11th birds on migration arrived at Tees-mouth (R.D.S.).

91. **WHITE WAGTAIL**.—Birds seen on migration at Cowpen Marsh, Teesmouth, April 19th two, 20th at least ten, 28th one, May 3rd six, 4th two (R.D.S.). September 20th, one near Belford (H.T.). On September 24th, at Spittal, Berwick, an adult cock (F.B.).

96. **BRITISH NUTHATCH**.—In South Durham this species is seen more frequently than formerly and would appear to be slowly increasing in numbers. It breeds regularly to the south of Darlington and up the Tees Valley to Barnard Castle and beyond (J.B.N.). On February 25th a pair was watched in its old haunt at Blackwell Grange Park, Darlington (M.G.R.).

108. **BRITISH WILLOW-TIT**.—South-west Durham; not known in Upper Teesdale (H.W.). South-east Durham; first recorded, *i.e.* distinguished from Marsh-tit, at Hurworth Burn in 1930, since when it has been frequently noted. It is probably little less common than the Marsh-tit; but its distribution has not been properly worked out (J.B.N.). In March three or four pairs were seen in Crookfoot Woods, D. One pair was already at work excavating a nesting hole in the same dead tree as it had used in the previous year (R.D.S.). South Northumberland; still breeding in Gosforth Park, where the Marsh-tit is rarely seen (R. and A.). Breeding about Blagdon, where it is common. Only scattered pairs of Marsh-tits are found in that district. It has been noted in many other localities near Morpeth, Ponteland, etc., and nesting holes have been observed at Prestwick Car (R. and A.). Not noted about Allendale, where several pairs of Marsh-tits are breeding (R. and A.). North Northumberland; Craster district—'When identification is possible, I estimate that I see roughly two Willow-tits to each Marsh-tit' (J.M.C.). Coquetdale, above Rothbury, a couple noted on April 18th (J.A.McG.). Font Valley, near Pigdon; a couple noted on April 12th (J.A.McG.).

119. **RED-BACKED SHRIKE**.—On May 23rd, at Seaton Point, near Alnmouth, N., a cock bird was seen perched on a post. It allowed of a close-up view so that identification was easy (F.G.G.). It is very unusual to see adult birds on the coast.

120. **WAXWING**.—None was reported in 1945.

121. **SPOTTED FLYCATCHER**.—More than usually plentiful in both counties this summer. Last seen September 24th and 25th, probably passing migrants at Alnmouth (H.T.).

123. **PIED FLYCATCHER**.—First seen: April 16th, a pair at Hunter House, Shotley Bridge, D. (G.A.C.). April 20th, a cock near Rothbury (J.A.McG.). These are unusually early dates. Increasing in Upper Weardale (R.M.). From 17 nesting boxes put up in woods in Upper Weardale, 103 young were successfully reared (per T.R.G.). Plentiful in Coquetdale about Hepple and in Allendale, N. Several pairs near Meldon, N. (R. and A.).

129. **CHIFFCHAFF**.—A bird seen on December 1st, in osiers by the River Tweed at Norham, N., with greyish brown plumage, very light underparts, whitish patch on throat and pale narrow eye-stripe, was undoubtedly a specimen of one of the Continental sub-species; but whether the Scandinavian or Siberian form could not be determined in the field (F.B.).

132. **WILLOW WARBLER**.—First seen: April 11th, near Rowlands Gill (C.H.). April 12th, Blagdon (R. and A.), Hexham (E.M.C.), Stocksfield (G.W.T.). Last seen: September 25th, Alnmouth (H.T.).

145. **GRASSHOPPER WARBLER**.—Increased in more than one district where trees have been recently felled. Two pairs were located at Blagdon where last year there were none and where in the previous year (1943) there had been between 9 and 12 breeding pairs (R. and A.).

153. **SEDGE WARBLER**.—Less plentiful than formerly at Gosforth Park Lake (C.J.G.).

162. **BLACKCAP**.—Last seen on October 17th, two cocks at Alnmouth, probably on migration (H.T.).

164. **LESSER WHITETHROAT**.—South-west Durham, not known in Upper Teesdale (H.W.). South-east Durham, not a numerous species but it occurs in

small numbers about Darlington, Stockton and Gainford (J.B.N.). South Northumberland, June 25th, a pair feeding young out of nest near Kirkley, N. July 24th, a pair feeding young at Stannington, N.—'the first we have seen in this district' (R. and A.). North Northumberland, an occasional and erratic visitor (J.M.C.).

173. **FIELDFARE**.—As early as August 24th a small party was seen near Hole Row Farm, Consett, D. A close view was obtained and they were clearly identified (E.M.). The main autumn flocks arrived late. On October 30th, eight birds were seen flying in from the sea near Souter Point, D. (J.R.C.). On the same day a large movement was noted inland at Allenheads, N., where a constant flow of packs of birds was seen flying across the moorlands in a South-westerly direction during the whole of the day. Many of the packs were hundreds strong. Grouse on the moors were very unsettled when the flocks of Fieldfares flew low over the heather; many of them rising and joining the flocks for a time, but eventually wheeling back to their own haunts. By the next day the movement was over and only a few stragglers were to be seen flying hither and thither (G.A.). On November 4th, 300 to 400 were seen near Rowlands Gill (C.H.), and on the 8th a flock of 500 at Capheaton, N. (J.R.C.).

175. **BRITISH SONG-THRUSH**.—An adult ringed at Blagdon, N., on July 2nd, 1943, was recovered at Kilkeel, Co. Down, on February 2nd, 1945 (R. and A.). This, together with other evidence, shows what becomes of some of our local Song-thrushes in winter.

178. **REDWING**.—First heard passing over Berwick on October 9th; ten seen on October 29th (F.B.). October 30th, one seen flying in from the sea near Souter Point, D. (J.R.C.). November 3rd, ten seen flying in from the sea at Fenham Flats, N. (J.R.C.). More than usually plentiful in the lower Vale of Derwent, this autumn, where they were first noted on November 7th (C.H.). A plantation near Blagdon, N., is used each winter as a roost; birds arriving in hundreds each night, fighting out before sunrise in the morning (R. and A.).

182. **RING-OUZEL**.—On November 17th a cock was seen feeding on hawthorn berries near Fenham Flats (F.B.).

184. **BLACKBIRD**.—On October 29th, several small parties were seen on the dunes and shore at Holy Island as if newly arrived from overseas (F.B.). On October 30th small parties, flocks of 4, 2, 1, 3, were seen to arrive on the coast from overseas near Souter Point, D. (J.R.C.). Reported to be very plentiful in the autumn in many parts of both counties.

In our Report for 1940, we recorded that a hen Blackbird had been found dead at Embleton, N. on February 17th of that year, bearing a ring which showed that it had been marked in Heligoland. It now transpires that this bird had been ringed at Heligoland as an adult migrant on March 10th, 1939. A juvenile ringed at Gosforth on December 29th, 1942, was recovered where ringed on January 2nd, 1945. A bird of the year, ringed at Blagdon, N. on August 18th, 1944, was recovered at Banbridge, Co. Down on January 30th, 1945 (R. and A.).

197. **WHINCHAT**.—A pair successfully reared two broods in Gosforth Park (R. and A.). Last seen September 21st, three at Holy Island (H.T.).

201. **REDSTART**.—Last seen September 21st, one at Holy Island (H.T.).

202. **BLACK REDSTART**.—A hen frequented the cliffs in Manhaven, South Shields, D. It was first seen on January 20th and remained until February 1st (J.R.C.). A hen was seen near Seaton Point, Alnmouth, N. on May 23rd (F.G.G.).

208. **BRITISH ROBIN**.—David Lack, who is making a study of local and seasonal variations in the number of eggs laid by the Robin, asked for information from the two Northern Counties. So far the number of supposedly completed clutches recorded shows that out of 59 nests forty contained five eggs, seventeen contained six eggs and two contained seven. Five eggs may therefore be considered to be a normal clutch in this neighbourhood. It is noteworthy that 12 of the 17 six-clutches were recorded from the Middleton-in-Teesdale district.

218. **BRITISH DIPPER**.—On May 16th a bird was seen in Jesmond Dene carrying material to a nest near the waterfall (C.J.G.). Whether breeding was successful is not reported.

220. **SWALLOW**.—A young bird ringed at Blagdon, N. on August 6th, 1944, was recovered where ringed in May, 1945 (R. and A.). A young bird ringed at Stocksfield, N. on July 5th, 1942, was recovered where ringed in July, 1943 (T.E.H.).



235. GREEN WOODPECKER.—Teesdale : noted as far up as Middleton (H.W.). Becoming very plentiful in Upper Weardale. Can now be heard in every wood in the Wolsingham district (R.M.). Reported from Rowlands Gill (C.H.), Gosforth Park (J.A.McG.). Woolsington (per R. and A.), Blagdon (R. and A.). Hulne Park, Alnwick (J.E.R.), Roddam Dene, N. (per J.M.C.), Haughton Castle Woods, N. (P.G.W.).

244. SNOWY OWL.—The following note, relating to 1942, appeared in *B.B.*, Vol. XXXVIII, p. 318 (September, 1945): 'Snowy Owl in Northumberland. Just before dusk on May 16th, 1942, I watched a Snowy Owl (*Nyctea scandiaca*) as it quartered a field near Alnmouth, Northumberland. It was a big white owl and the upper parts (which were all I could see as it was flying low), were fairly strongly barred brown. The flight was much stronger than the usual owl's flit. The Handbook has recorded only three for Northumberland. Andrew Noel.'

249. LITTLE OWL.—Further extensions of its range have been reported. In Teesdale it has been at Barnard Castle for some years (J.B.N.). In Weardale a pair established itself in a wood near Wolsingham in September, 1945 (R.M.). Durham City area, 'on the increase in this district' (J.T.H.). Breeding again at Fulwell, Sunderland (F.W.). Tynedale, a pair nested near St. Oswald's, above Chollerford (P.G.W.). Haydon Bridge, 'not yet noted in this area' (W.J.). Sweethope, N.: Two pairs recently established (J.R.C.). Chathill area: first seen in 1944 (A.J.M.). Craster: 'continues to appear in this district' (J.M.C.). Cullernose (H.T.). Beal, N., November 3rd (J.R.C.).

250. LONG-EARED OWL.—One at Holy Island, August 31st (F.B.). One at Alnmouth, October 5th and 17th (H.T.).

251. SHORT-EARED OWL.—Still common as a breeding species on the moors, recently afforested at the head of North Tynedale, N. On July 26th one was seen near Greatham Creek, Teesmouth, flying over the marshes (R.D.S.); and from early October a single bird was seen regularly at Teesmouth (R.D.S.). As a migrant, one seen on September 17th on the coast at Spittal, Berwick (F.B.).

253. BRITISH TAWNY OWL.—On April 20th a nest containing two eggs was found on the top of a 20-foot elm stump, quite exposed except for a 2-inch margin all round. The eggs hatched and the young fledged safely (R. and A.).

254. WHITE-BREASTED BARN OWL.—Four broods of young were ringed in the Blagdon-Gosforth area, N. On January 4th a young bird was seen at Blagdon which appeared to have just left the nest, as it still retained some down and could not fly strongly (R. and A.).

259. PEREGRINE FALCON.—On October 30th a nearly adult (second autumn) hen was killed near Fallodon, N. by a vermin trapper. It weighed 2 lbs 4 oz. It was sent to the Hancock Museum by Mr. H. B. Herbert. On December 28th, at dusk, a very fine large adult hen was shot at North Ancroft, 4 miles south of Berwick-on-Tweed. It weighed 2 lb 8½ oz. It was sent to the Hancock Museum by Mr. R. H. Dodds. It is a disaster that two hen Peregrines should have met this fate in North Northumberland within the space of two months; but nothing can be done in the matter, as, in the interests of R.A.F. carrier-pigeons, the Peregrine is no longer a 'protected' species. Single birds, seen in the neighbourhood of Holy Island on September 2nd, 9th, 12th and 29th (F.B.) may have been one of the above specimens. A single bird was seen on December 20th at Broomlee Lough at the same time as a Hen Harrier, which, on two occasions, was seen to make sallies at it (M.G.R.). A pair of Peregrines attempted to breed in Upper Teesdale, on the Yorkshire side of the river. Three eggs were laid, but they were taken (H.W.).

262. MERLIN.—During the last few days of March a female haunted some gardens at Gosforth. On the 30th it was picked up dead after striking a wireless aerial (R. and A.). In Allendale, early in July, two pairs were located, one having a brood of young just out of the nest (A. and R.). A merlin, ringed as a nestling at Goathland, Yorks. on June 20th, 1938, was recovered at Corbridge, N. on September 7th, 1944 (*B.B.*, Vol. XXXVIII, p. 349).

268. ROUGH-LEGGED BUZZARD.—A single bird again visited the moors near Wolsingham, D. It was first noted on August 12th and last seen on October 1st. This period is almost identical with that of last year, when it was first seen on August 10th and remained until September 30th (see 'Report for 1944') (R.M.).

269. COMMON BUZZARD.—On April 9th a single bird was seen at Blagdon, N. pursued by rooks, jackdaws and a pair of kestrels (R. and A.). Other reports of



' Buzzards ' have been received ; but the species was not definitely determined. The Common Buzzard is increasing in numbers and spreading in many parts of England and Wales and should be more frequently recorded for the two counties.

273. HEN-HARRIER.—On December 20th a female was observed quartering a reed-bed at Broomlee Lough, N. It was seen under very good conditions, the white patch on the rump was very obvious and, during a head-on view, the facial ruff was clearly visible (M.G.R.). It is of interest to record that ten years ago, almost to a day, December, 1935, a cock was seen at the same place (G.W.T.).

277. SPARROW HAWK.—A bird ringed as a nestling at Blagdon, N. on July 7th, 1943, was recovered two years later, on July 17th, 1945, at Angerton, N. (R. and A.).

289. COMMON HERON.—The Gainford Heronry seems to be well established in its present location. When visited on April 28th, twelve nests were counted and young birds were being fed (J.B.N.).

At Blagdon a pair laid 3 eggs in last year's nest, but they were taken. It built again in a 25 feet Scotch pine and laid 4 eggs, but this nest was also robbed. In August, a pair of Herons with two young were seen in the same wood, which may have been the result of a third attempt (R. and A.).

In the Styford Heronry, N., fourteen nests were counted containing many young (T.E.H.).

In the Reedsmouth area there are two Heronries, one contained four pairs and the other only two. Many trees here, which were formerly used, have been recently felled and others have been blown down.

The Heronry at Thropton, N. fared badly. On March 30th there was only one occupied nest. Later in the season the nest was re-visited and the parent birds, with four young, were found shot and hung up on the tree. No other nests were occupied (T.G.W.).

In the Chillingham, N. Heronry fifteen nests were occupied (T.R.G.).

Heron ringed as nestlings in Rogaland, Norway, during the years 1939 to 1943, have been recovered in the British Isles, most of them in their first autumn or winter ; thus a bird ringed on June 12th, 1941, was recovered at Alnwick, N. in November of the same year. No doubt much of our winter Heron population is bred overseas (B.B., Vol. XXXVIII, p. 225).

297. BITTERN.—In January one was seen at Brasside, D. (J.T.H.). On February 5th a female was shot at High Stotfold Moor, near West Hartlepool, D. (J.W.R.). On December 31st, two Bitterns were flushed from the reeds at the North-west end of Gosforth Park Lake. The birds rose one after another very close to the observer and were clearly seen as they flew over the lake (Mr. Horsley, per T.R.G.). Three days later, January 3rd, 1946, one of these birds was flushed from a ditch to the south side of the lake by another observer who obtained a very clear view of the bird in flight (J.A.McG.).

300. WHOOPER SWAN.—During the winter of 1944-45 very few wintered on Northumbrian waters, only small parties being reported. January 4th, seven ; April 11th, two ; on Grindon Lough (G.A.C.). In the following winter, 1945-46, Whoopers came late to the loughs. On October 28th, six adults appeared on Greenlee Lough, but there were none elsewhere (J.R.C.). On November 8th there were only three on Capheaton Lough, and on December 19th, ten at Capheaton and one on Bolam Lough. On December 28th and 30th 82 birds were reported from Greenlee alone, of which 69 were adults and 13 cygnets (J.R.C., M.G.R. and F.B.).

301. BEWICK'S SWAN.—Very few reported up to the end of the year. A family party of five, including three cygnets, was on Broomlee Lough on December 20th, 28th and 31st (M.G.R. and J.R.C.).

303. GREY LAG-GOOSE.—On October 6th, one was seen on Holy Island sands (F.B.). Out of a flock of about 40 'grey' geese which roosted regularly at Shiellow near Lowick early in December, one or two Grey-Lags were shot and identified ; the species of the remainder of the flock was not ascertained (A.H.B.). On December 3rd, eight were definitely identified at Hallington Lough. They appeared to be a family party (J.R.C.).

304. WHITE-FRONTED GOOSE.—During December, a flock of eight arrived at Shiellow near Lowick, N. Three were shot, two being adult and the third immature. They kept themselves strictly aloof from the other 'grey' geese which were using the same roosting and feeding grounds (A.H.B.).

307. **PINK-FOOTED GOOSE.**—In the afternoon of November 7th, a flock of 51 birds came in from the East-south-east, crossed the beach at Whitburn, D. and, flying very low passed inland. On the 16th, 50 birds, probably the same flock reduced by one, flew out to sea from the direction of the Cleadon Hills. The flock was last seen on the 24th, still 50 strong (J.R.C.). On November 26th a flock of 36 was definitely identified at Teesmouth (J.R.C.). From early November onwards several hundreds roosted regularly on Goswick Sands, N. (F.B.).

311. **BARNACLE GOOSE.**—On October 7th, off the Stag Rocks, Bamburgh, a flock of about 24 flew in from the direction of the Farne Islands about sunset and headed towards Fenham Flats (F.B. and H.T.).

313. **BRENT GOOSE.**—A single bird seen at Alnmouth on February 17th and 25th and again on March 1st was almost certainly of the pale-breasted form (H.T.).

315. **SHELD-DUCK.**—For many years passed, Sheld-duck have only been able to nest securely at Teesmouth in artificial holes in the slag breakwaters; but during the war years they have again bred successfully, protected by barbed wire, amongst the sandhills along the Durham coast as they used to do before South-east Durham became so industrialised. It is feared that this will not continue now that the shore is open to the public. On January 11th, in severe weather, a flock of about 100 birds was counted at Teesmouth. On March 22nd, 50 birds were still present, but by April 28th only five pairs were in residence (R.D.S.). Sheld-duck had a most successful breeding season on the North Northumberland coast. On July 7th, at least six families were out on Fenham Flats, and on July 13th, there were three families on Holy Island sands. One pair had 9 young and several had 8 each (F.B.). On December 8th, a single bird was noted on Whittle Reservoir (J.R.C.).

316. **RUDDY SHELD-DUCK.**—An adult female spent more than a fortnight on a flooded field in North-east Durham. It was first noticed on May 5th, and was seen almost daily until May 22nd (H.M.S.B. and F.G.G.). During the same period single birds were seen on May 7th and 19th at Alnmouth, N. (H.T.). It is probable that these birds had strayed from some ornamental waters.

317. **MALLARD.**—This and other surface-feeding duck were more than usually plentiful on the coast and on inland waters in the autumn of 1945. By the end of October there were over 3,000 Mallard and more than 8,000 Wigeon north of Holy Island (F.B.). A flock of duck floating off the mouth of the Tees on December 21st, stretched for nearly a mile up the coast. It consisted of at least 1,700 Mallard, 120 Wigeon and 80 Teal (J.R.C.). The Mallard population of Gosforth Park Lake increased steadily during the winter. On December 16th, there were 1,224 present (598 drakes and 626 ducks) (J.R.C.). On December 21st and 28th, there were about 350 birds on Seaton Burn Ponds, N., but these may have been part of the Gosforth Park stock (W.R.L.).

318. **GADWALL.**—On January 5th, an adult drake was seen on Gosforth Park Lake with a damaged left wing-tip (R. and A.). An immature bird, probably a drake, was on Gosforth Park Lake from August 23rd until the end of the year. On August 29th, and again on September 28th, it was in company with another immature bird, and on September 30th, three were present (J.R.C. and G.W.T.). A single drake was seen on Jarrow Slake on May 20th (J.R.C.). A pair remained on a flooded field in North-east Durham from April 27th until May 2nd (H.M.S.B.). Gadwall are much more frequently seen now than formerly.

322. **GARGANEY.**—For several years birds have been observed during the breeding season with increasing frequency, as previous Reports have shown. This spring a pair remained on a flooded field in North-east Durham for eight weeks. They were first seen on March 31st, and were kept under observation by three separate recorders almost daily. At first they were always together and on April 15th and 16th, the drake was watched displaying before the duck. On April 21st, two drakes were in attendance. From the 22nd the duck was often missing during the day, but came in to feed with the drake during the evening. On May 9th, there were again two drakes with the duck, and on the 10th four adult birds were present. On the 13th, the drake was again alone during the day, but was joined by the duck in the evening. The pair remained together until the 20th, which was the last time the duck was seen. By this time the drake was beginning to moult and it lingered, though less often seen, until June 16th, when it was in full eclipse. It seems highly probable that breeding was attempted (H.M.S.B. and F.G.G.). On another flooded area near Sunderland, a pair was seen on May 10th, they were

not present two days earlier. They were still together on May 21st, but on May 24th the duck was absent and was not seen again. On the 26th, there were two drakes, but the second was not seen again though the first lingered until June 4th (F.G.G.). In the marshes at Teesmouth a pair was observed on April 11th, two pairs on the 14th, and a single pair on the 19th and 20th (R.D.S.).

325. PINTAIL.—A pair was under observation on a Northumbrian lough until April 30th, after which date the drake was not seen again; but on May 28th, a duck with young in the down was seen there. The duck crouched amongst the reeds until almost trodden upon, when it flapped along the ground feigning injury and remaining within five feet of the observer. Four young were counted, but there may have been more (J.R.C.). A pair was seen at Blagdon, N. on April 15th and again on May 1st (R. and A.). A pair remained on Holy Island sands from May 10th until July 13th, by which time the drake was in eclipse, but no young were seen (F.B.). On April 6th, a pair was feeding in a brackish pool at Teesmouth (R.D.S.). The first autumn Pintail was seen at Gosforth Park on August 23rd. On the 29th, five were present and during October the number increased to seven, while two or three remained throughout November and December (R. and A., C.J.G. and W.A.W.).

326. SHOVELER.—Bred successfully on one of the Northumbrian loughs this year (J.R.C.). A duck with six half-grown young was seen on August 8th on some flooded fields in South-east Northumberland and one with four smaller young on August 10th at the same place (R. and A.).

328. COMMON POCHARD.—This species has bred for the last few years in South Northumberland; but for obvious reasons the exact locality cannot here be stated (J.R.C.). Pairs have been observed until quite late in the breeding season in other parts of the county, but breeding has not yet been proved. Two pairs were on Haggerston Castle lake until May 4th (F.B.); and a pair was seen at Blagdon on May 23rd (R. and A.).

330. TUFTED DUCK.—During the winters of 1944-45 and 1945-46, an old quarry pond near Tynemouth has been much frequented by flocks of this species. On January 24th, 1945, the pond being ice-free when other waters were frozen, 150 were counted. In December, 1945, at least 100 were present (J.R.C.).

332. GOLDENEYE.—A flock of about 60 was observed on the Tweed near the junction of the Whitadder on February 10th, and was still there on March 1st; but by April 10th, it was reduced to 14, and on the 17th only two drakes remained (F.B.). On March 11th, an adult pair was on Gosforth Park Lake, while during autumn and winter juveniles were regularly seen there (R. and A.).

334. LONG-TAILED DUCK.—Inland. In the Report for 1944, it was recorded that in March of that year a Long-tailed duck spent some time on Fulwell Waterworks Pond, D. Further particulars of this bird have now been received. It was first noted on December 26th, 1943, and was then in immature plumage and was last seen on April 5th. During its 3½ months residence it rarely left the pond and was never absent for more than a day or two at a time. By the beginning of April it had assumed the plumage of a first summer drake with a long pointed tail (F.W.). On November 10th, 1945, an adult female in full winter plumage was seen on Hallington Reservoir, where it remained for two or three days in close company with a female Tufted Duck (T.F.H. and G.W.T.).

337. COMMON EIDER.—Eiders fared very badly on the Farne Islands and on Holy Island. On the Inner Farne, where there was no 'watcher,' practically all the eggs were collected for food. During the 10 days ending July 15th, a census was taken of Eiders of all ages seen off the coast between South Shields and Berwick. The total number counted was 774 birds amongst which were only 142 young in 43 families (J.R.C.). On May 6th, a single drake was seen in the river at Teesmouth; it is unusual to find them so far south in summer (R.D.S.).

339. COMMON SCOTER.—From November 25th to the end of the year, a flock of 300 birds appeared daily off shore near mussel beds at Seaton Carew, D. (R.D.S.). On November 28th, out of a flock of 73 birds seen off Warkworth, N., only one was an adult drake (H.T.).

340. VELVET-SCOTER.—This species has been noted more frequently than usual off the coast. March 26th, one off Alnmouth (H.T.). April 7th, four in the Tweed Estuary (F.B.). September 15th, a flock of from twelve to fifteen in Holy Island Harbour (F.B.). November 9th, thirteen seen flying north near Whitburn, D. (J.R.C.); 10th, three off Whitburn (J.R.C.); 18th, three off



Bamburgh (H.T.) ; 26th; two off Newbiggin (M.G.R.). December 15th, eight or more off Scremerston Seahouses (H.T. and F.B.).

341. **SURF-SCOTER**.—On December 8th and 11th, a fine drake was seen with a large flock of Common Scoters and two or three Velvet-scoters close in shore off Cheswick Rocks, south of Berwick. It was so well within range that it was easy to note every distinguishing feature, including the white patch on the nape (F.B.). This is the first record for Northumberland for this rare vagrant.

342. **GOOSANDER**.—The Upper Coquetdale Goosander was seen on May 8th sitting in the usual hollow tree. Later, broken remains of about five egg-shells were found in the nest, proving that young had been successfully hatched. The entrance to the hollow tree is 10 feet above the ground and is always used by the adult bird ; the nest is at ground level and the young, on hatching, can emerge through a small hole at the base of the trunk (T.G.W.). On May 27th, a duck with eight small young was seen some miles lower down the river, which may have been the above brood (R. and A.). From January 18th, Goosanders were frequently observed on the North Tyne above Bellingham ; at one time three drakes and a duck were seen together. On June 2nd, the duck was seen with a brood of six young, in down, which could only have been bred in the immediate neighbourhood (Mrs. J. Robson). A single duck was seen on the Tweed as late as May 8th (F.B.). On January 17th, two drakes were on Crookfoot Reservoir, and on February 24th, a drake was found dead at Hurworth Burn Reservoir (R.D.S.). The Rev. G. F. Courtenay, from 1907 to 1929, never once recorded this species from either of these reservoirs.

343. **RED-BREASTED MERGANSER**.—Inland. A single mature male was seen on Hebburn Ponds, D., on April 3rd (F.G.G.).

344. **SMEW**.—Several were recorded in the winter of 1944-45. On November 11th, 1944, one was seen on Little Swinburne Reservoir, N. On January 11th, 1945, one on Crookfoot Reservoir, D. On February 1st and 4th, a female on a pond near East Boldon, D. On March 3rd, one at Capheaton, N. From March 4th to 11th, one on a pond in South-east Durham (J.R.C.). This winter, 1945-46, only one has so far been reported, a female on Little Swinburne Reservoir on January 5th, 1946 (J.R.C.).

346. **CORMORANT**.—During the winter of 1944-45, a party of six birds regularly frequented the Tyne at Dilston, N., at least 25 miles from the sea. The last was seen and shot on April 12th, when it was in full breeding plumage (Mr. Gledson, per S.E.C.). A single bird frequented the North Tyne at Bellingham, at least 40 miles up the river, during the winter and was later picked up dead (Mr. Gledson, per S.E.C.). A Cormorant, ringed as young on the Farne Islands on July 27th, 1938, was recovered six years later, June 1st, 1944, at Berwick-on-Tweed (B.B., Vol. XXXVIII, p. 350).

355. **MANX SHEARWATER**.—As already reported by Dr. H. M. S. Blair (B.B., Vol. XXXVIII, p. 276), it is now proved that this species has attempted to breed in County Durham. In June, 1939, a school-boy, Wilfred Robson, of South Shields, succeeded in reaching the top of Marsden Rock, and there found a single egg lying under an overhanging rocky outcrop covered with grass. He took it home thinking that it was the egg of a Puffin ; but later it was examined by Dr. Blair who identified it as that of a Manx Shearwater. No birds have been seen about the Rock either in the summer of 1939 or since ; but as the coast was closed to the public during the war years, they might have escaped notice.

368. **FULMAR PETREL**.—Durham Coast. The main arrival of birds at Marsden took place in mid-February. On February 7th, none was to be seen there ; but by the 15th, our first spring day, Marsden Bay was alive with Fulmars. Thirty were counted north of the 'Grotto,' most of them sitting about on ledges ; 17 south of the 'Grotto,' and 21 on the north side of the 'Rock.' In all, 68 were counted, but there were many more planing about or resting on the sea. On March 11th, 21 birds were afloat in Frenchman's Bay (F.G.G.). On June 3rd, a count made between South Shields and Sunderland, which includes Marsden, gave a total of 136 adults, some on ledges and others flying. On August 13th, only 18 adults were present and 48 young were on the ledges. On July 10th, on the coast between Sunderland and Teesmouth, there were 119 adults in all ; by August 14th, there were only 11 adults and 16 young on the ledges. This in spite of the fact that during the season many eggs had been taken or destroyed and both sitting birds and young stoned by visitors to the now re-opened coast (J.R.C.).



Northumberland Coast. On the Farnes at least one pair bred on the cliffs of the Brownsmann. About 28 pairs were present at Cullernose Point and about 13 pairs at Dunstanburgh (James Fisher); but at both sites all the eggs were taken (J.M.C.). On Holy Island there were about 36 pairs in all and on the cliffs between Berwick and the Border about 22 pairs (F.B.). In North Northumberland three separate inland sites were occupied, one of these being six miles from the open sea and the other two being little short of that distance. A maximum of five pairs was present at one of these sites and at least one egg was laid. No eggs were reported from the other two, but they may have been laid and destroyed (F.B.).

370. GREAT CRESTED GREBE.—No birds were seen on the pond in South-east Durham where a pair attempted to breed in 1944 (see Report for 1944) (J.R.C.). Owing to the low water-level in the Northumbrian reservoirs and loughs throughout the season, no breeding took place there. A pair was seen at various times on three different reservoirs, but no nest was found and no young seen.

371. RED-NECKED GREBE.—On February 10th, a single bird in breeding plumage was seen at the junction of the Tweed and Whitadder (F.B.). On November 7th, two, in winter plumage; were observed close in shore at Seaham (J.R.C.).

373. SLAVONIAN GREBE.—On December 23rd, 1944, one was seen on Broomlee Lough (J.R.C.); and another, perhaps the same bird, on Greenlee, on December 28th (Rev. A. Hervey).

374. BLACK-NECKED GREBE.—On January 17th, one was seen at Crookfoot Reservoir, D., under favourable conditions so that its specific characters could be clearly noted (R.D.S.). On August 1st, Thomas Edmondson, of Leigh, Lancs., saw three birds of this species in full adult summer plumage on the East Reservoir at Hallington. Mr. Edmondson is familiar with the species in breeding plumage having observed it in Cheshire in 1941. On a subsequent visit they were not to be seen. The only previous record for this species in breeding plumage in Northumberland was reported by the late Clarence Smith, who saw two birds at Hallington on May 8th, 1935 (see Report for 1935, in *Vasculum*, Vol. XXII, p. 87). From August 25th to 29th an immature bird was present at Gosforth Park Lake (J.R.C.). A single bird was seen in South Shields Harbour on four occasions between September 27th and October 6th (F.G.G.). On November 9th, one was seen off Seaburn, Roker (J.R.C.); and on the 16th, an immature bird was seen close in shore at Spittal, Berwick (F.B.).

376. GREAT NORTHERN DIVER.—An immature bird in winter plumage was seen on Colt Crag Reservoir from March 14th to 28th (J.R.C.).

378. BLACK-THROATED DIVER.—On October 14th, an immature bird was seen near Ross Sands, N. (F.B.); and on November 7th, one was seen close in shore near Seaham, D. (J.R.C.).

379. RED-THROATED DIVER.—On March 26th, 60 or more were present at one time in Alnmouth Bay; 25 to 30 were seen throughout April, and 7 as late as May 11th. From early September to the end of the year varying numbers up to about 15 were present (H.T.).

380. WOOD PIGEON.—A bird ringed as a nestling at Blagdon, N., on August 11th, 1943, was recovered, where ringed, after being killed by a Sparrowhawk on May 21st, 1945 (R. and A.).

381. STOCK DOVE.—On March 31st, a nest containing two well incubated eggs was found near Ponteland, N. An early date! (R. and A.).

386. BAR-TAILED GODWIT.—Last seen on Holy Island sands, May 13th, a single bird (F.B.). First seen at same place September 2nd, five birds. On September 29th, a flock of 400 to 500 (F.B.). First seen at Teesmouth, September 1st, two; 10th, three (R.D.S.).

387. BLACK-TAILED GODWIT.—On April 16th, a single bird was seen at Greatham Marsh; on the 18th, 19th and 20th, one in summer plumage feeding with Knots (R.D.S.). On April 21st, six in full red plumage visited a flooded field in North-east Durham, but passed on without alighting (H.M.S.B.). On April 28th, a party of ten was seen in summer plumage on Cowpen Marsh, D. (R.D.S. and P.L.H.); the same party seen the following day (J.R.C.). On August 8th and 11th, a juvenile was seen at Brenkley, N. (R. and A.). As showing the increase in the visits of this species, it is interesting to note that Abel Chapman, writing in *The Borders and Beyond* in 1924, stated that he had only once met with the species on the North-east Coast.

389. WHIMBREL.—On February 3rd, one was clearly identified at Teesmouth by R.D.S. and O. C. Hill of the Dorman Museum. It was feeding near a Curlew so that it was possible to compare their distinguishing features. A most unusual date!
393. WOODCOCK.—October 30th, four flushed from bents between Roker and Souter Point (J.R.C.). November 4th, 'One in my garden at "Wellfield," Alnmouth' (H.T.).
398. JACK SNIBE.—Many at Blagdon, N. during the winters of 1944-45 and 1945-46 (R. and A.). Odd birds at Alnmouth, N. on January 11th and 31st, and on March 5th (H.T.). October 2nd, one on Yarrow Slack, Tweed Estuary (F.B.).
403. KNOT.—On April 18th, a flock of about 400 was feeding around pools at Teesmouth; about 100 remained until May 9th, by which time one or two were beginning to show a little chestnut colouring (R.D.S.). July 24th, one in red plumage at Alnmouth (H.T.).
404. DUNLIN.—The Dunlin has bred again on the moorlands of West Durham (H.W.). On September 28th, a single bird was seen at Gosforth Park—'the first we have seen there' (R. and A.). On February 2nd, 1940, a Dunlin was recovered at Beal, N. that had been ringed as a migrant at Öland, Sweden, on September 10th, 1937 (*B.B.*, Vol. XXXVIII, p. 243).
406. CURLEW SANDPIPER.—On May 26th, two or three were seen on Holy Island in breeding plumage (F.B.). On August 14th, one at Alnmouth in red plumage (H.T.). On September 2nd, a dozen with Dunlin on Holy Island sands (F.B.).
407. LITTLE STINT.—On July 22nd, one was seen on a flooded field in North-east Durham (F.G.G.).
416. SANDERLING.—From May 15th to 27th, a flock of 100 remained along the shore at Seaton Carew, D. (R.D.S.); and from September 1st to the end of the year from 100 to 150 birds were seen regularly at the same place (R.D.S. and P.L.H.). Small parties were seen at Alnmouth on July 22nd and 31st, and on August 6th (H.T.). On October 7th, 1939, a Sanderling was recovered at West Hartlepool that had been ringed as a migrant at Jøeren, Norway, thirteen days previously, September 24th, 1939 (*B.B.*, Vol. XXXVIII, p. 243).
417. RUFF.—As stated in the 'Handbook,' the spring emigration of the Ruff from the east coast takes place almost entirely south of the Tees; nevertheless they are occasionally reported from the Northumbrian coast. On May 10th, a flock of 16 was seen on Holy Island Sands, six of them were beginning to show summer plumage (F.B.). On the autumn passage, however, birds are seen frequently, both on the coast and on inland marshes and sewage-farms. This year many reports have been received of birds seen from late July to October, though September is the month of greatest activity. Many of these are birds of the year (F.G.G., R. and A., M.G.R., H.T. and F.J.N.). On October 7th, a Ruff and two Reeves were present on Budle Bay, and at one time the Ruff rose from the water's edge and settled on the water some 25 yards from the shore, remaining there for about half a minute before rising easily to return to the shore (H.T. and F.B.).
- [419. BROAD-BILLED SANDPIPER.—On August 27th, a bird was observed in company with a Ruff on the edge of a brackish pool in a field near the Black Low, Fenham Flats, N. Its chief characteristics were that it was smaller than a Dunlin and had a very distinctly striped back, with neck and flanks also striped; the stripes on the flanks being very noticeable and extending back to the legs. The white on its chin extended narrowly between striped patches of breast, then rapidly broadened out into white under-parts. The eye-stripe was very light, the bill black, broader and deeper at the base than that of a Dunlin and blunt at the tip. Legs blackish and comparatively short. In flight it showed a tail with a dark patch down the middle and white patches down each side and a narrow white stripe across the wing, less noticeable than that of the Dunlin and apparently further back. It uttered a sharp 'tue' as it rose, quite unlike the softer call of the Dunlin. It was watched through binoculars at a distance of three or four yards for half an hour in full sunlight, so that it was possible to observe and write down on the spot all the details described above. The recorder is confident that his identification was correct (F.B.). There has been no previous record for this very rare species in Northumberland].
423. WOOD SANDPIPER.—One seen on a flooded field in North-east Durham on May 15th and 16th, and again on May 20th and 21st (H.M.S.B., F.G.G. and J.R.C.). One seen on a marsh in South-east Durham on August 18th (J.R.C.).

424. GREEN SANDPIPER.—Small numbers, usually single birds, were reported from various places in both counties in the months of January, May, July, August, September and November.

428. BRITISH REDSHANK.—Bred successfully not far from South Shields (H.M.S.B.). On April 17th a bird was found sitting on four eggs at Blagdon, N., an early date (R. and A.). 'Out of a flock of c.100 birds seen at Alnmouth on August 20th, one was the darkest bird I have ever seen. It was very heavily marked on the back and underside. Heavily marked birds turned up here occasionally, but this one was outstanding and must have been either the Icelandic or the Continental form, probably the latter in view of the heavy underside markings' (H.T.).

431. SPOTTED REDSHANK.—On August 26th, two were seen on a marsh in South-east Durham (J.R.C.). On September 16th and 19th, two were seen at Greatham Creek, D. (R.D.S.). On September 22nd, two juveniles on Budle Bay (H.T.). On September 28th, an adult and two juveniles were seen on a small pond between South Gosforth and Gosforth Park. They were easily approached to within 10 yards (R. and A.). On October 5th, a juvenile at Alnmouth (H.T.). On October 7th, one on Budle Bay, N. (H.T. and F.B.). It is interesting to note that Abel Chapman, writing in *The Borders and Beyond* in 1924, made the statement that he had only once met with this species on the north-east coast, a single bird on August 19th, 1918.

432. GREENSHANK.—On spring migration records are uncommon; but one was seen on a flooded field in North-east Durham on April 19th (H.M.S.B. and G.W.T.). On autumn migration more birds were reported from the coast than usual. The first was seen as early as July 7th, on Fenham Flats, N. (F.B.). During August and September several were recorded from the Northumbrian coast and from Teesmouth. One was seen on Budle Bay on October 7th (H.T. and F.B.). Inland one was seen on August 19th, at Whittle Reservoirs (F.B.); and on August 29th, four were on Holborn Moss, Belford, N. (F.B.). On September 9th, one passed over Allendale Town flying from east to west (H.M.S.B.).

435. RINGED PLOVER.—Two pairs reared three young each on the shore between South Shields and Sunderland. In each case the eggs were laid within a barbed wire enclosure. Another nest, with four eggs, also amongst barbed wire, placed only a few yards from South Shields promenade wall, was destroyed by visitors to the beach (J.R.C.). After our local birds had settled on their breeding stations, flocks of migrants continued to pass along the coast. On May 26th, several such flocks were seen on Holy Island Sands to a total number of between 200 and 300 birds (F.B.).

439. KENTISH PLOVER.—On September 21st, on the shore near Spittal, Berwick, F.B. noted a small plover which differed in so many respects from the common Ringed Plover that his attention was immediately drawn to it. Seen at very close range with binoculars under most favourable conditions it showed the following characters: as compared with the Ringed Plover, smaller size, longer legs which were very dark in colour. Light sandy band on sides of upper breast with large amount of white exposed on the front; upper parts, including head, sandy brown and paler than Ringed Plover; distinct and complete white eye-stripe; very dark band from bill to eye and across ear-coverts (not a broad patch as in Ringed Plover); neck ring not darkly bordered; white wing-bar narrower but more clearly defined than in Ringed Plover; noticeable white line along tips of secondaries; sides of tail broadly white which extended to sides of rump. F.B. is convinced that this bird can only have been a Kentish Plover. There is only one previous record for this species in Northumberland, that of Abel Chapman, who on August 23rd, 1918, saw a couple of adult birds amongst a mixed group of Ringed Plovers, Sanderlings and Dunlins on Budle Bay (see *Borders and Beyond*, p. 113).

444. GREY PLOVER.—On spring passage: May 10th, on Holy Island Sands, a flock of 18, about half in full breeding dress and others in various phases of plumage; May 26th, 5 still remaining (F.B.). On autumn passage: first seen on August 30th, on Cheswick shore, one, still in breeding plumage; September 22nd, 35, many showing black underparts; at end of October still 30 to 40 (F.B.). On October 2nd and 3rd, several passed along the coast at Teesmouth—'a bird I rarely see at Teesmouth' (R.D.S.).



449. **LAPWING OR PEEWIT.**—Owing to the scarcity of breeding birds in some areas, our contributors were asked to report on their observations. Here are some of them :—

Durham. Tees estuary marshes, 'certainly not plentiful, only about four pairs nesting around Greatham Creek' (R.D.S.). Middle and Lower Teesdale, there has been a marked decrease in the number nesting during recent years (J.B.N.). Upper Teesdale, no marked scarcity as compared with previous three or four years (H.W.). Durham City neighbourhood, very scarce round this city; more so even than in the spring of 1944 when they could be put down as scarce. Fields round Rainton village, always favoured by these birds, are now only very sparsely populated. I have only heard of one nest this year from a field where, seven years ago, anything up to 40 nests could be found (J.T.H.). South Shields, 'not quite so plentiful as they were last year, but I have so far regarded this as no more than a seasonal fluctuation. Certainly I would not speak of a "marked scarcity." I think local diminutions are due to turning pastures to wheat and other crops. Nests are repeatedly destroyed by tractors and the like' (H.M.S.B.). Hole Row Farm, Consett, 'on this farm we had a lot more attempts at nesting this year; but unfortunately we are too near the Consett area for them all to succeed, though some hatched. There must have been more in the vicinity too, as a party of 40 or more haunted one of our fields from mid-June onwards' (E.M.).

Northumberland. Todburn Steel Farm, Slaley (240 acres), 'six pairs in April, rather fewer than last year' (T.C.). Haydon Bridge, 'about the same number as last year, but nests very heavily raided each year' (W.J.). Northumbrian Loughs, 'as common as ever' about the end of March (H.M.S.B.). Lower North Tynedale, 'some farmers think the scarcity of Peewits is due to the tractor in the fields. In olden times, when the horse was used, the farmer had time to lift any eggs he found to one side out of danger; but with the tractors he cannot see the eggs and they get smashed' (P.G.W.). Upper North Tynedale, 'Very few breeding pairs this year where they used to be abundant' (C.B.A.). At Blagdon, Seaton Burn, on an area of rather more than one square mile, 30 nests were counted in 1944 and only 9 in 1945; but all through April, 1945, a large flock of about 50 non-breeding birds was flying about in this area, whereas there were very few the previous year. The conclusion is that there was more or less the same number of birds in the neighbourhood, but fewer of them bred' (N.R.). North-east Coast Area, 'very scarce in the immediate neighbourhood of Alnmouth. On April 19th, I counted the birds seen from the train between Alnmouth and Newcastle, a distance of 30 miles, on one side of the way into town and on the other on the return journey. The total was only 16 birds, which seems a very low figure' (H.T.). Alnwick to Craster, 'breeding birds slightly more numerous than last year, but still sadly few in numbers' (J.M.C.). West Fleetham Farm, Chathill, A.J.M. writes July 30th: 'There is little or no decrease in these birds here, as, when rolling a field of corn only 13 acres in extent, I found four nests each containing four eggs. I always return the eggs after going over the ground. This may, I think, account for no decrease here.' South of Berwick, 'common and wide-spread as a breeding species' (F.B.). Thropton, 'there is no scarcity of Peewits in this neighbourhood, if anything rather an increase' (T.G.W.). It is evident that there is a definite decrease in the number of breeding birds in some areas and the concensus of opinion seems to be that this is due to modern intensive farming and to raiding of eggs. The above data will form a basis for comparison in future reports. A bird ringed as young at Wolsingham, D. by R.M., on June 17th, 1942, was recovered at Roweltown, Cumberland, in August, 1945. A bird recovered at Acklington, N. in October, 1944, had been ringed as young at Skelton, Cumberland, on July 4th, 1943 (*B.B.*, Vol. XXXVIII, p. 371).

452. **BRITISH OYSTERCATCHER.**—A pair or two has bred for some years on some gravel beds on the lower South Tyne (W.J.). It is now probably breeding even lower down the valley. At Netherton, near Thropton, N., an Oystercatcher laid three eggs in the same field as last year (see Report for 1944). These were destroyed by Crows and later two more were laid, but these proved infertile (T.G.W.).

462. **BLACK TERN.**—On May 22nd, one was seen on a flooded field in North-east Durham (H.M.S.B. and F.G.G.). On September 19th, two adults in winter plumage were seen on Seaton Sands, Teesmouth, in company with Sandwich and Common Terns with which their size could be compared (R.D.S.). On October 3rd, a party of six was seen flying north off Berwick Pier (F.B.).



467. **SANDWICH TERN.**—The breeding colony this year returned to its normal haunt on the Brownsman, Farne Islands, where about 150 pairs nested and did well. Two watchers spent eight weeks on the Brownsman this season, with the result that all the breeding species on that island and on the adjacent Pinnacles had an unmolested season. No Sandwich Terns bred on the Longstone where they formed a colony the previous year. No birds appear to have attempted to breed at the Teesmouth; the only birds seen there being on passage along the coast.

469. **COMMON TERN.**—A breeding colony on the mainland near Holy Island was much harried and most of the eggs were taken (F.B.). From 10 to 20 pairs attempted to breed at Teesmouth, but all the nests were robbed (J.R.C.).

470. **ARCTIC TERN.**—A few pairs nested as usual on the Longstone, but the Inner Farne colony did badly as there were no watchers on that island.

471. **LITTLE TERN.**—Bred again on the Northumberland coast. A nest with eggs was seen on June 25th (F.B.). At Teesmouth birds were first observed on May 11th, and several pairs hung about the estuary during the breeding season, but no eggs were found (R.D.S.).

477. **LITTLE GULL.**—At Budle Bay, on September 8th, two immature birds were seen under most favourable circumstances. They alighted on the flats in company with Terns and Black-headed Gulls, with which it was easy to compare their size and plumage (T.F.H. and G.W.T.). On September 1st, members of the Cleveland Naturalist's Field Club, from the South Gare, Teesmouth, saw an immature Little Gull flying across the mouth of the river (R.D.S.).

478. **BLACK-HEADED GULL.**—The Greencroft Ponds Gullery, near Annfield Plain, D., described in the Report for 1944, has met with a serious set-back. When the birds arrived this spring, open-cast coal-mining was being carried on close to the larger pond. This caused the birds to resort to the smaller pond; but here tree-felling and land reclamation were in progress. Many nests were built however and eggs were laid; but the blasting of the tree-roots and the systematic raiding by egg gatherers drove the birds away and no young were reared (F. Wade). A bit of marshy land on a remote moorland in North-west Durham has been used as a breeding ground by a varying number of Gulls for many years. This year 40 nests were counted in May. So far this gullery seems to have escaped molestation by egg collectors (F. Wade). The water level at Hallington Reservoir being low throughout the year, the island was united with the shore and therefore became easily accessible; the nests were systematically raided and no eggs were hatched. At Holborn Moss N., on May 26th, from 3 to 4,000 birds were present; many of the nests held eggs and many had young in down (F.B.).

481. **COMMON GULL.**—During March and April large roosting flocks assembled each evening on the sands at Goswick and Spittal, N. Throughout the evening there was a steady and continuous drift of birds mainly following the course of the River Tweed to the estuary and then along the shore to Goswick where 4 to 5,000 were estimated on March 13th, at 7 p.m., B.S.T., and at least 10,000 on April 9th, at 7-30 p.m., D.S.T. By early May numbers were much reduced, chiefly immature birds remaining. On June 1st, there were still 50 to 60 roosting nightly (F.B.).

482. **HERRING GULL.**—Durham Coast: the number breeding at Marsden has not diminished. Six young were reared on the top of the Rock and at least four others were observed elsewhere (F.G.G.). Northumberland Coast: at Dunstanburgh two broods of two each were reared. A Herring Gull ringed as young in West Norway on July 8th, 1938, was recovered at Stockton, D., on August 28th, 1939 (B.B., Vol. XXXVIII, p. 245).

484. **SCANDINAVIAN LESSER BLACK-BACKED GULL.**—On August 28th, on the Tweed Estuary, a single bird was seen 'standing conveniently between a British Lesser and a Great Black-backed Gull for comparison,' and on September 10th, out of a flock of 30 which all appeared to be of this sub-species, eight were definitely identified (F.B.).

485. **BRITISH LESSER BLACK-BACKED GULL.**—First noted at Alnmouth on March 17th (H.T.). First noted on Tweed Estuary on April 10th (F.B.). Some remained later than usual, for on November 19th, 20 were seen, and on December 4th, one was observed at Gosforth Park; these were all the pale-backed British sub-species (F.B.).

486. **GREAT BLACK-BACKED GULL.**—Some hundreds roost in winter with the thousands of Common Gulls on Goswick Sands (F.B.). Another favourite winter

roost in Northumberland is Hallington Reservoir, again in association with Common Gulls, while others roost at Colt Crag (H.T.).

487. GLAUCOUS GULL.—Several were reported from the coast in the early part of the year, usually single immature specimens. On January 16th, however, as many as 20 were seen together with other Gulls at a roost near Hendon, Sunderland (J.R.C.).

488. ICELAND GULL.—On January 20th, an adult was seen near Marsden, D., on the ground in company with two Glaucous Gulls, one adult and the other immature, with which it could be compared. On September 5th, an immature specimen was seen at Hebburn Ponds, D., in a mixed flock of other Gulls bathing and drinking there. It was slightly smaller than the Herring and Lesser Black-backs. Its wings at rest projected well beyond the tail. It was of a dead white colour without markings of any kind, so probably a bird of the previous year (J.R.C.).

489. KITTIWAKE.—The first birds were noted at the Marsden colonies on February 20th, and the last were seen about the cliffs on September 5th. In the three colonies a total of about 750 nests was counted (F.G.G.). It was estimated that at least 2,000 birds were present on the coast, so there must have been many non-breeding birds (J.R.C.). Fifteen nests were counted at the Dunstanbrough Colony (J.M.C.). On the Farne Islands they are reported to have had a good season. On November 9th, between 10-30 a.m. and 4-30 p.m., 1,976 birds were counted flying north up the coast off Whitburn shore, D., chiefly in small flocks of not more than 50 in number. The movement continued steadily throughout the day, no birds pausing to feed, but all speeding northwards. During the following day only three birds were noted, and on November 11th, no movement whatever took place (J.R.C.). A Kittiwake picked up dead on Waskerley Moor, D., 25 miles from the sea, by R.M., in April, 1941, had been ringed as young in the Murmansk Area, Russia, on July 28th, 1940. Another ringed in the same area on July 23rd, 1941, was recovered at St. Abb's Head, Berwick, on December 26th, 1941 (B.B., Vol. XXXVIII, p. 246).

491. GREAT SKUA.—One watched flying north at Alnmouth, on August 18th, attacked a Great Black-backed Gull with apparent success (H.T.). September 2nd, one seen over Holy Island Sands (F.B.).

492. POMATORHINE SKUA.—On November 9th, the day of the movement of the Kittiwakes, see above, between 10-30 a.m. and 4-30 p.m., from Whitburn shore, 65 birds were counted flying north along the coast, either singly or in small flocks of up to 14 in number. Ninety per cent. of these were of the white-breasted form. On the two following days none was seen (J.R.C.).

493. ARCTIC SKUA.—First seen Alnmouth, August 16th, and last seen at Bamburgh, on September 22nd (H.T.). On November 9th, two of the dark form were seen flying north up the coast off Whitburn shore (J.R.C.).

504. CORNCRAKE.—South-west Durham: four birds were located in Upper Teesdale, three being on the Durham side of the river. One of these was in a hayfield at Leakworth, near Middleton, where later its nest and eggs were destroyed during hay-cutting (H.W.).

South-east Durham: 'This was a plentiful species until its sudden and general decrease throughout the country (except the higher and more northerly regions) in 1915-17. It continued to come to this area in small numbers, however, until 1938, when there was a further sharp decrease, almost to vanishing point, except in the upper dales. This year it was heard in the third week in June at Etersgill, near High Force; several were heard at Barnard Castle, but no evidence of successful nesting was obtained' (J.B.N.).

Mid-Durham: 'Has not been heard in this district for three years' (J.T.H.). Lower Derwent Valley: none heard (C.H.).

Northumberland.—Fawdon: one heard July 24th (A.M.). Walton: one heard on two occasions in April and May (E.W.M.). Rothley: one heard in early June (*Newcastle Journal*, 19.vi.1945). Slaley: one heard mid-May (T.C.). Haydon Bridge: a single bird was heard calling on May 3rd, and for two or three days thereafter in a field about half-a-mile east of Haydon Bridge, where one was heard last year. No others were noted (W.J.). Allendale: from July 2nd to 12th, there were three pairs within hearing distance of the middle of the town (R. and A.). Hexham: one was heard near the Reservoir where it was reported in previous years (P.G.W.). Humshaugh: one at Haughton Strother where

reported last year (P.G.W.). Thropton : one heard July 4th (Miss Dodd, per H.T.). Netherton : none heard or seen in this district (T.G.W.). Craster : one heard for three days in 1945, the first time for ten years (J.M.C.).

509. WATER-RAIL.—On April 22nd, near Stamfordham, a Water-rail was killed by a Spaniel, on her nest, which contained four eggs (J. McAvoy). Apparently a fair number at Gosforth Park Lake judging by their cries at dusk (C.J.G. and R. and A.). Also heard at Swinhoe Lake and at Blagdon (R. and A.).

520. QUAIL.—At West Fleetham, Chathill, N., during hay-cutting on June 20th, a reaper passed over a Quail sitting on a nest containing 13 eggs. The bird was so much damaged that it died soon after. The eggs were placed under a domestic hen, but none of them hatched. No Quails had been heard in the neighbourhood (A.J.M.).

Key to the initials occurring in the above Report :—G. Aikenhead (Allenheads) ; Mrs. C. B. Anderson (North Tyne) ; Dr. H. M. S. Blair (South Shields) ; A. H. Booth (Ravensworth) ; F. Brady (Berwick) ; T. Clissold (Slaley) ; G. A. Common (Upper Derwent) ; S. E. Cook (Hancock Museum) ; Mrs. E. M. Cramb (Hexham) ; J. M. Craster (Craster) ; J. R. Crawford (Durham Coast, etc.) ; C. J. Gent (Gosforth Park) ; T. R. Goddard (Hancock Museum) ; F. G. Gray (South Shields) ; Miss R. Grey (Hexham) ; J. T. Hay (Durham) ; B. P. Hill (Newcastle) ; Dr. T. F. Hird (Corbridge) ; Mrs. T. E. Hodgkin (Stocksfield) ; P. L. Hogg (West Hartlepool) ; C. Hutchinson (Vale of Derwent) ; W. Johnson (Haydon Bridge) ; W. R. Lofthouse (Gosforth) ; G. R. Lunn (Cullercoats) ; J. A. McGeoch (Newcastle) ; A. MacRae (Newcastle) ; R. Martinson (Upper Weardale) ; E. Miller (Vale of Derwent) ; Miss E. W. Miller (South Northumberland) ; A. J. Murdud (Chathill) ; J. B. Nicholson (Darlington) ; Prof. F. J. Nattrass (Newcastle) ; 'R. and A.' = M. W. and N. Ridley and S. and J. S. Ash, N. Ridley (Blagdon) ; M. G. Robinson (Forest Hall) ; J. W. Rowell (Elswick) ; J. E. Ruxton (Alnwick) ; R. D. Sintern (Teesmouth) ; G. W. Temperley (Stocksfield) ; H. Tully (Alnmouth) ; T. G. Wallace (Thropton) ; H. Watson (Upper Teesdale) ; F. White (Sunderland) ; Miss P. G. Wood (Mid-Tyne) ; W. A. Wright (Lower Tyne).

**Birds in Colour**, by **Walter E. Higham**. Pp. 176 with 89 colour photographs by the author. Collins, 25/-. Although the author of this book devotes much space to the technique of bird-photography there are excellent chapters on bird-watching for its own sake, on methods of attracting birds to the garden, and on general ornithological topics. Mr. Higham has established a name for himself as a bird photographer, and the illustrations to this book are, in the main, up to the highest standards. It should be emphasised that all the pictures are reproductions of colour photographs taken in Kodachrome. The films used vary in size from 16 mm. cine films, 35 mm. film of the miniature camera, to quarter-plate cut film. Some of the smallest originals have suffered a little in enlargement, but a book of this kind shows something of the wonderful possibilities of colour photography for naturalists in the immediate future. The true colours do not appear to have suffered in reproduction to any marked extent, although the red of the breast of the male bullfinch (Plate 10) seems unusual when looked at in daylight.

This book has the merits more or less common to those written by experienced practical men. The chapter on the technique of bird photography is packed with valuable information for the intending nature photographer.

Over a period of 25 years Mr. Higham has employed apparatus costing in the aggregate well over a thousand pounds, but the careful reader will soon be reassured and will realise that even now good work may be accomplished with equipment of comparatively low cost. In the chapter on birds in the garden are to be found lists of suitable trees to plant, types of bird tables, the right kind of nesting boxes and the sort of food to offer. It is perhaps to be regretted that sixty pages of this charmingly produced book are devoted to short classified descriptions of garden birds. Nothing is said as to songs and cries, and the reader might well have been referred to any one of the many excellent and low-priced books for information of this kind.



**British Garden Flowers**, by **George M. Taylor**. Pp. 48, with 8 colour plates and 26 illustrations in black and white. Collins, 4/6.

**Trees in Britain**, by **A. L. Howard**. Pp. 48, with 8 colour plates and 18 illustrations in black and white. Collins, 4/6. These two volumes are welcome additions to the natural history sections of the deservedly popular Britain in Picture series. Arriving together and being read on successive evenings, it is impossible, however odious comparisons may be, for the reviewer not to measure the one against the other. Mr. Taylor wins. He is an expert gardener whose horticultural skill is happily matched by an ability to write engagingly about the plants he grows. With so big a field to cover in so limited a space he confines his remarks largely to those proved and universal favourites, the Roses, Delphiniums, Phloxes, Iris, Narcissus, Sweet Peas, Carnations, Pansies, and the like which have come to hold a special place in the affections of all lovers of garden flowers. He agreeably mixes botanical, historical and geographical information in describing the origins and merits of the species referred to, the fashions and achievements of the old florists and the evolution of the best modern strains by the the skill of the expert plant breeder of to-day.

Mr. Howard voices the widespread concern amongst naturalists and lovers of the English countryside over the ever-diminishing woodlands of Britain; a concern which is not allayed by the activities of a Forestry Commission principally engaged in the widespread establishment of great conifer plantations. The slower-growing, indigenous trees which do so much more to beautify and give character to our landscape, even though they also yield timber of value have long been neglected and the attention they receive to-day is still altogether disproportionate to their merits. Mr. Howard punctuates his account of the principal native and introduced timber trees with frequent historical references and observations culled from Pliny, Evelyn and the older connoisseurs of trees. Botanists will take exception to some statements such as the claim that our two indigenous Oaks differ only in the stalked and sessile attachment of the acorns and that 'in all other respects . . . they are alike.' The Holm Oak is unquestionably—not probably—an introduction in this country: *per contra* the Small-leaved and Large-leaved Lime are usually accepted as natives. To avoid the use of the words species and genus, presumably on account of their being technical expressions, does not justify the substitution as synonyms of the words variety and family; and in a book which consistently omits—and rightly so—the authorities for scientific names, it is odd to read that Witches Brooms on Birch are 'produced by a fungus known as *Exoascus turgidus sadeb.*' If room can be found for mention of this and at least one other fungus affliction of trees it could surely have been found for some mention of the economically far more important Dutch Elm disease or the Water-mark Disease of the Cricket-bat Willow. The printing of all Latin names with a small initial generic letter is as displeasing in appearance as it is contrary to custom and in so far as the normal procedure in this respect is employed in the other volume under review, some general editorial supervision is required to ensure uniformity in such matters.—W.A.S.

\* The current issue of the *Transactions of the British Mycological Society* contains papers on 'Mycology and the War,' being the Presidential Address by G. Smith and dealing particularly with problems of mould control in equipment and materials for export to tropical regions; 'Notes on some British Fungi ascribed to *Phoma* and related Genera,' by R. W. G. Dennis; 'Spore Discharge in *Daldinia concentrica*,' by C. T. Ingold; 'A Daily Census of *Alternaria* Spores caught from the atmosphere at Cardiff in 1942 and 1943,' by H. A. Hyde and D. A. Williams; 'Ecology of the larger Fungi,' by J. Grainger; 'Myriangium,' by T. Petch; 'An Undescribed Species of *Chaetomium* with four-spored asci,' by S. J. Hughes; '*Uromyces Genistae-tinctoriae* in Scotland,' by J. A. Macdonald, together with some shorter papers, reviews and reports of the 1945 Foray and the Annual General Meeting.

The Bootham School Natural History Society's Survey of Askham Bog which formed the subject of an article in our last issue has now been printed as a 75-page booklet which may be had from the Bannisdale Press, 46-47 Chancery Lane, London, W.C.2, price 8/6. We are glad to note that many of the errors in the original typescript report have been corrected.



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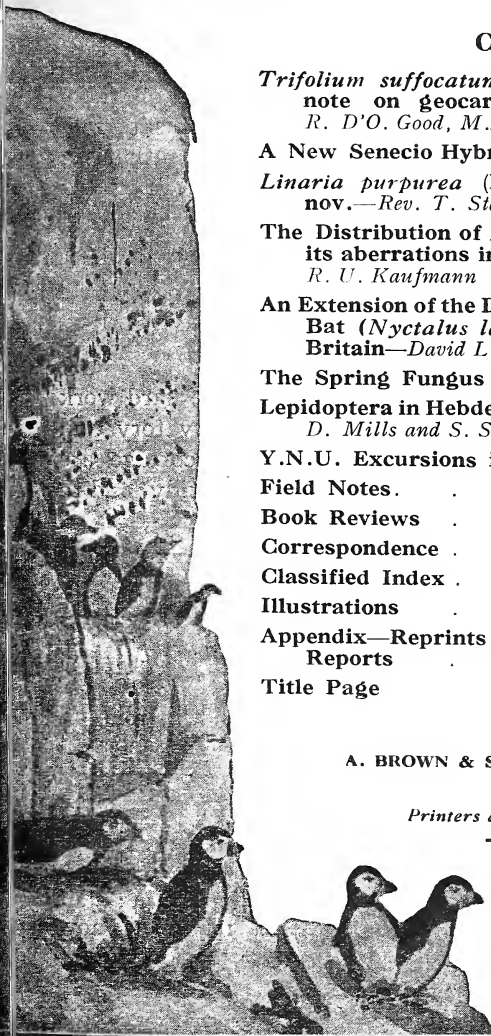
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**TRIFOLIUM SUFFOCATUM L. IN YORKSHIRE  
WITH A NOTE ON GEOCARPY IN THE LEGUMINOSAE**

R. D'O. GOOD, M.A., F.L.S.

THE finding of *Trifolium suffocatum* L. at Kilnsea (V.C. 61) during the Yorkshire Naturalists' Union Whitsun excursion to Spurn, adds to the Yorkshire flora a comparatively little known British plant, and one which, both geographically and biologically, is of peculiar interest.

According to Taubert (1) this species and *T. glomeratum* comprise the subsection



Map of England and Wales (with county boundaries) showing the areas from which *Trifolium suffocatum* L. has been recorded.

*Micranthemum* of the subgenus *Triplastrum* and both occur in Britain in sandy and gravelly places, the latter being rather commoner than the former, which is more or less restricted to the coast.

*T. suffocatum* (like *T. glomeratum*) belongs to the Oceanic Southern element of the British flora (2) and its main area of natural distribution is in the countries on the northern side of the Mediterranean. Here it is recorded from Asia Minor and the Cyclades, over Greece, Dalmatia, Istria, the adjacent parts of Hungary, Italy, and France, as far west as the neighbourhood of Marseilles. It does not seem to

occur in Spain, but is known from Sardinia, Sicily and Malta and from North Africa. From this main region its range extends on the one hand to the Canaries, Madeira and the Azores, and on the other, northward along the Atlantic coast from Portugal, through western France as far as Cherbourg and the Channel Islands, and across the Channel into England and Wales.

From information derived from specimens in the Herbaria of Kew, the British Museum, Cambridge and Oxford (for details of which I am greatly indebted to those in charge of these collections); from county and other floras (for help with which I am indebted to Dr. Sledge); and from other information, it would appear that the plant was first noted in Britain at Yarmouth in 1792 and has up to now been recorded from the following areas:—

- W. CORNWALL (V.C. 1): Scilly Islands; round Penzance; the Lizard.
- S. DEVON (V.C. 3): along the south-east coast from Budleigh Salterton to Slapton.
- W. SOMERSET (V.C. 5): Minehead.
- E. SOMERSET (V.C. 6): Weston-super-Mare; Lilstock.
- DORSET (V.C. 9): sandy heaths of the Frome Valley; round Poole Harbour; Weymouth.
- ISLE OF WIGHT (V.C. 10): St. Helen's Spit; the Dover, Ryde (these are perhaps one and the same).
- S. HAMPSHIRE (V.C. 11): round Christchurch; Southampton; Southsea and Hayling Island.
- W. SUSSEX (V.C. 13): Hermitage and Thorney Island; West Wittering; Littlehampton.
- E. SUSSEX (V.C. 14): from Eastbourne at intervals to Rye.
- E. KENT (V.C. 15): from Lydd to Sandwich.
- W. KENT (V.C. 16): Chislehurst, Blackheath and Plumstead.
- E. SUFFOLK (V.C. 25): from Felixstowe and Woodbridge to Lowestoft and Bungay.
- W. SUFFOLK (V.C. 26): the Breckland.
- E. NORFOLK (V.C. 27): Yarmouth; Broome.
- W. NORFOLK (V.C. 28): Burnham Deepdale.
- GLAMORGAN (V.C. 41): Rhosilly (3); round Cardiff (4).
- ANGLESEY (V.C. 52): Beaumaris.
- CHESHIRE (V.C. 58): Parkgate (5).
- E. YORKSHIRE (V.C. 61): Kilnsea Warren.

These areas are shown on the accompanying map and it will there be seen that they amount to four separate major areas; i.e. S. E. Devon, Dorset to W. Sussex, S. E. Kent and adjacent Sussex, and the coastal parts of Suffolk; together with some dozen outlying places. Only in the Breckland is the plant really other than littoral. In fact, the plant is a good deal more restricted than the map suggests, because it is local and sparse even in the larger areas, while the size of those indicating isolated records is of necessity exaggerated. The actual space occupied by the plant is very small.

In which of these localities the plant is now to be found is impossible to say. It is accepted as extinct at Weston and it may be assumed so at Weymouth. The Cheshire record is over a hundred years old; it appears to be many years since the plant was collected at Beaumaris; and the Glamorgan records may all have been transitory and casual, so that it is doubtful if the species is persistent now north of the Bristol Channel. Its stronghold in this country is in Suffolk, where it has been repeatedly collected in the last 150 years.

Druce (6) says there are doubtful records for S. Essex, Flint and W. Lancashire, and both he and Watson (7) include E. Cornwall, but the latter queries this and I can find no confirmation of it. The British distribution has been depicted graphically by Salisbury (8) in a map which shows an area from the Wash right round to the Bristol Channel, but this is much too continuous, and it also omits the interesting inland area of the sandy Breckland in West Suffolk.

*T. suffocatum* L. is a plant of open or turfey places on gravelly and sandy soils particularly in the neighbourhood of the sea, because presumably it is there that the particular edaphic conditions that it favours are most frequent. It is from just such a place, Kilnsea Warren, at the base of Spurn Point, that the new Yorkshire record comes, but the status of the plant there is not altogether clear. Although, as has just been said, Kilnsea Warren is naturally a likely spot for it, *T. suffocatum*

has never been recorded there until now and on this occasion was growing, not in undisturbed ground, but in the open sand of neglected cultivation patches surrounding some military hutments. This would suggest a casual origin but the species was growing in great luxuriance among others natural to the area and was not obviously an element in an adventive flora. It is also difficult to imagine how a plant so inconspicuous, local, and peculiar in habit (see below) as *T. suffocatum* could become transported to Kilnsea, and there are no indications that it may have come from abroad. The most interesting point however is that the plant should only now and never before have spread to (and having done so to flourish in) a place which is clearly enough edaphically, and now demonstrated to be climatically, suitable for it. One explanation may be that the partially cultivated condition of the ground may have lessened the competition of other species while sufficiently preserving certain vital edaphic conditions, so enabling the plant to establish itself where otherwise it might be vainly contending for a place.

Whether or not this is so there is another possible explanation. The occurrence at Kilnsea is an extension northwards of its distribution on the east coast of England of about 60 miles, and of its absolute northern latitudinal limit by some 10 miles. Besides this the dates of the various records of the species in this country show that it has appeared in a number of new places in comparatively recent years and has intensified its range to some extent. These points at once suggest a parallel with *Himantoglossum hircinum*, the Lizard Orchid, in which it has been possible definitely to correlate a spread of rather the same kind and period with actual changes in climatic values (9). Indeed, it was in the course of this correlation that the occurrence of this orchid in Yorkshire was anticipated, a prevision which materialised only a year or two later. Not the least interesting point of this new record for *Trifolium suffocatum* is the possibility that it may be the consequence of similar circumstances and may thus afford additional confirmation of the views expressed in connection with the Lizard Orchid.

Biologically *T. suffocatum* is remarkable in being one of the select band of Leguminosae, 6 species in all, which are geocarpic, that is to say which ripen their seed below the surface of the soil in which they grow. How this most peculiar habit, so contradictory to the normal practices of Angiosperm reproduction, has come about in the course of evolution: why, as is apparently the case, it should be rigidly confined to this one family; and why it should (as will be seen) be manifested in more than one form, are problems which need not be debated here, but a short account of the plants concerned may well be useful as well as interesting.

The best-known example of geocarpic (10) is the earth-nut, pea-nut or monkey-nut, *Arachis hypogaea* L. (11, 12, 13), now widely cultivated in warm and hot countries for the sake of the abundant oil and other reserves in its seeds, but generally regarded as a native of Brazil. Here the plant is erect and of a size and stature rather that of a dwarf French bean and its flowers are borne in much the same relative positions. They are, however, remarkable in two respects: first, that although appearing to be long-stalked they are in fact almost sessile, the apparent pedicel being actually a very deep thread-like calyx tube, at the base of which the ovary lies; and, second, that the very short axis immediately below the ovary, and between it and the calyx, namely the gynophore, lengthens greatly after pollination and before the ovary begins to swell, bends downwards, and buries the young fruit in the soil. This elongated gynophore much resembles a root and has been called a carpopodium. Darwin gives a good account of this proceeding and graphs of the movement of the carpopodium as it bends down (14).

Very similar but much less familiar is the kandelabean, *Kerstingiella geocarpa* Harms, cultivated in, and presumably a native of, parts of former Togoland in West Africa (12). Here just the same thing happens, but the plant is smaller and has a creeping stem from which the leaves grow up, and the flowers are sessile in the axils of the leaves so that they lie very near the soil. Nevertheless, after pollination, the gynophore lengthens into a carpopodium which may reach a length of an inch or more, and the fruits ripen in the soil. They rather closely resemble those of *Arachis*.

The Angola-pea, earth-pea, or bambarra-nut, *Voandzeia subterranea* Thou., is also a native of tropical Africa and rather widely cultivated there (15). It is like *Kerstingiella* in form except that the flowers are borne, generally in pairs, at the ends of short stout peduncles which grow on or slightly into the soil. Here, too,



the method of burial is different, it being these peduncles and not the gynophore which elongate and carry the young fruits below the surface.

These three species are the classic and only examples of geocarp in its most highly-developed form, but three of the 'clover' section of the family Leguminosae are also notably geocarpic, though they are small plants and their methods of fruit burial simpler.

The first two are *Trifolium subterraneum* and *T. suffocatum*, both natives of this country, and belonging to the Southern Oceanic element of the British flora. Details of the latter have already been given and the former is much the same except that its British range is much less littoral and covers almost all England south of a line from the Mersey to the Humber. Its Mediterranean range includes Spain and Crimea. Both species inhabit rather loose sandy soils.

*T. subterraneum* is a small plant with spreading, prostrate stems from the leaf axils of which the peduncles arise, each bearing a cluster of up to twelve flowers. Of the flowers in each cluster only two or three develop normally, the rest becoming modified into a ring of small grapples formed from the calyces. After pollination the peduncles elongate slightly and turn downwards, the grapples finally anchoring the head to the soil, so that the perfect flowers become shallowly submerged and ripen their fruits below the surface. Darwin (16) gives a long account of this process and graphs of the movement of the peduncle, and also states that the hairs on the buried calyces are absorbent.

In *T. suffocatum* there is a different and simpler method of burial. Individuals of the species vary greatly in size and, especially when growing in turf, are often extremely small and inconspicuous and so easily overlooked, but in suitable places plants may be up to a foot across. Each consists of a stout vertical tap root from the top of which short, closely-appressed stems radiate in all directions. Not only is this primary radiation regular but each stem is thickly and closely beset with shorter parallel lateral branches so that a dense rosette results. The leaves, which are not unlike those of *T. repens*, have relatively long stalks and are best developed towards the ends of the branches, that is to say towards the periphery of the rosette. The flowers are borne in innumerable small sessile clusters in the leaf axils particularly towards the base of the stems, so that the centre of the rosette is an almost solid disc or cushion of inflorescences. The individual flowers are perfect but minute with the calyx longer than the corolla. Geocarp comes about simply by the circumstance that the central part of the rosette acts as a sandbinder or collector over which the loose sand in which the plant grows shallowly heaps itself so that most at least of the flowers are covered throughout their development. The Kilnsea specimens were for the most part large and illustrated this well, each appearing at first sight as a ring of clover leaves enclosing a slightly raised patch of sand, completely hiding the copious inflorescences. Like the other plants so far mentioned, *T. suffocatum* is an annual and is apparently reproduced by fertile seed, in which case the flowers must be self-pollinated.

Finally, the geocarpic habit is described also for *Trigonella Aschersoniana* Urb. (17), an Egyptian species not apparently well known. The method of fruit burial is said by Harms (18) to be similar to that of *Arachis* and *Kerstingiella*.

These six Leguminosae seem to be the only plants which exhibit true geocarp, though there are some others, such as *Cyclamen* and *Oxalis*, in which the mature fruits are brought to the surface of the ground at least by the curvature of the fruit-stalks, but these do not ripen their fruits subterraneously. It is also interesting to note in conclusion that at least three other members of the Leguminosae, namely, *Amphicarpaea*, *Vicia angustifolia* and *Lathyrus sativus* (19) are amphicarpic, having in addition to flowers of the normal kind, cleistogamous flowers which ripen seed below the surface of the soil and which are said somewhat to resemble root nodules. In *Amphicarpaea* (20) spp. short shoots are produced late in the season and these grow down into the soil and bear subterranean cleistogamous flowers.

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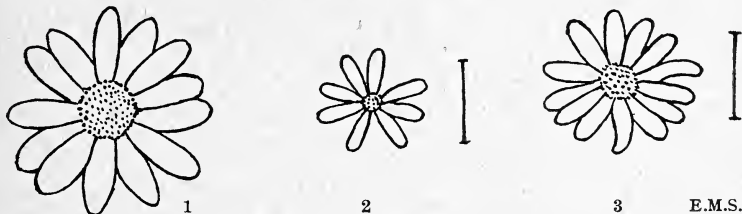


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### A NEW *SENECIO* HYBRID

REV. T. STEPHENSON, D.D.

I HAVE noticed for quite thirty years *Senecio vulgaris* L. var. *radiatus* Koch growing in small quantity at Aberystwyth, both about the town and along the Devil's Bridge railway. There were a few plants of *S. squalidus* L. where the G.W.R. left the Devil's Bridge railway; but I saw no hybrids. At Goodrington (Paignton) and



1. *S. squalidus* L.
2. *S. vulgaris* L. v. *radiatus* Koch.
3. Hybrid, *S. squalidus* x *S. vulgaris* var. *radiatus*  
(2 and 3, enlarged : scale indicates natural size).

at Teignmouth, near the gas-works, a few plants of *S. vulgaris* var. *radiatus* grew for many years. Suddenly, two years ago, many hybrids appeared at Teignmouth on small bombed areas and at Goodrington along the fence of the G.W.R. goods yard. Both grew near to *S. squalidus*. At Plymouth, the rayed groundsel was long known in small quantity along the Hoe. Now, in bombed areas, the hybrid has very much increased. Nothing of the sort is present in the bombed sites of Exeter. Bristol I know nothing about, on the other hand, in London, hybrids of *S. squalidus* and *S. viscosus* have occurred in several places (J. E. Lousley in *Rep. B.E.C.*, 1943-44 869-874 (1946)).

Mr. Nicholas Polunin of the Department of Botany, University of Oxford, has sent me the following information, taken from Druce's *Flora of Oxfordshire*, p. 241 " . . . . . We know *squalidus* was cultivated in the Oxford Physick Garden before 1699, for Bobart (*Hist. Ox.* 109, 1699) says 'Perennis est planta (most British authorities wrongly term it annual) hyememque facile sustinens. Ad Catanam et Taurominium frequens nascitur,' and of still earlier date are Bobart's specimens in his *Hortus Siccus*, and from a specimen in Herbarium Dubois labelled *Jacobaea aetna glauco folio* from Mr. Jacob Bobart about 1690. Nearly a hundred years later it had spread to the walls of Oxford, but even Sibthorp (*Fl. Ox.* 1794) failed to name it. Its identification was due to Sir Joseph Banks. By 1833 it had spread to Wytham. Shortly after taking up my residence in Oxford in 1879 it had reached the railway track near the Gasworks and by the side of Port Meadow. At that time the permanent way was made up to a great extent of clinker-ash and this dry material furnished the plant with a replica of the lava-soils of its native home in Sicily; now it is even more abundant and more showy than on the slopes of Mount Etna."

With regard to the hybrid, Mr. J. F. G. Chapple has sent me the following information. "The hybrid *Senecio squalidus* x *vulgaris* was given the name x *S.*

*Baxterii* by G. C. Druce in the *B.E.C. Report* for 1892, 374 (1893) without a description. This name is given in the first supplement to *Index Kewensis* 391 (1906) as "*Baxteri* E. F. Marshall" with the same reference as I have given above, both the name and author being incorrect." I take it that this is a cross of the unrayed groundsel with *S. squalidus*, which I have seen once at Plymouth and twice at Goodrington. In any case, the names are quite invalid.

The hybrid between the Oxford Ragwort and the rayed groundsel may be described as follows:

*Senecio squalidus* L. x *Senecio vulgaris* L. var. *radiatus* Koch, *hyb. nov.* Magnitudo planta (et habitus) similis eis *S. vulgaris*. Radii *S. squalidi*, numero 13, item hybridi. Radii *S. vulgaris* v. *radiati* Koch numero 8. Radii *S. vulgaris* var. *radiati* latitudine et longitudine vix aequantes eis *hyb.*

The size and habit of *S. vulgaris* and of the hybrid are about the same. Perhaps the latter is the more straggling. The rays of *S. vulgaris* var. *radiatus* are usually eight, but vary in number a little. They are a little shorter and narrower than those of the hybrid. The flower heads of *S. squalidus* are much larger than those of the hybrid. At Plymouth, however, a single hybrid turned up with a much larger disc than those described above. At Goodrington also a single hybrid was found much larger and more handsome than those above described. The disc was rather larger and the whole plant a fine golden yellow. It may be noted that, as often with crosses, the hybrid is infertile and probably very erratic in its appearance.

Though usually an eight-rayed plant there is some variation in the number of rays in the radiate groundsel and the cross between this and one with 13 rays may account for the variations in single plants of the hybrid, e.g. 13, 13, 8—13, 11, 11—9, 8, 11—10, 13, 9—8, 6, 13, 8—9, 10, 9, 8, 10.

The accompanying sketches of flower heads were kindly drawn by my daughter, Miss E. M. Stephenson. She also drew my attention to the extent of the variation in single plants from different localities.

Specimens of all these plants have been sent to the Herbarium at the British Museum.

### *LINARIA PURPUREA* (L.) MILL., VAR. *ROSEA*, VAR. *NOV.*

REV. T. STEPHENSON, D.D.

*Linaria purpurea* is reported as rare at Plymouth in 1880, rather rare in Berkshire, very rare in Hereford, not common in Buckinghamshire, rare in Surrey, and only in Kent 'fairly common.' About Torquay it is very common indeed. The typical plant prefers wall-tops. It grows about two feet high, with a narrow spike of numerous purple flowers. They vary considerably in the shade of purple, some being very handsome. The main stem is very straight. There are numerous very slender side-stems, which bear a few flowers. At one place a few plants occur of a lovely pink. There are not many of them so the locality had better not be exactly specified.

*Linaria purpurea* (L.) Mill., var. *rosea*, var. *nov.*—Planta habitu et magnitudine similis eis typus, sed colore rosea. (In harts, var Canon Went.).

A specimen of the variety has been deposited in the British Museum (Natural History), South Kensington.

**Two Plants new to Yorkshire: *Oenanthe fluviatilis* Coleman, and *Carex flava* L.**—On 1st July, 1946, an *Oenanthe* was collected by Mrs. J. Appleyard and myself in a swift-flowing part of the River Cock between Stutton and Tadcaster (V.C. 64). It had been observed here in immature condition by Mrs. Appleyard earlier in the year and recognised as probably distinct from *O. aquatica*. Examination proved it to be *Oenanthe fluviatilis* Coleman, which is new to the county. I am informed by Dr. W. A. Sledge that its previously known northern limit was in S. Derbyshire. It is well marked by the submerged leaflets being divided into broadly linear parallel segments, and the leaflets of the upper leaves are broader than those of *Oenanthe aquatica* (L.) Poir.

On 13th July, 1946, in Tarn Moss, Malham (V.C. 64), I collected a sedge of the *flava* group which appeared different from any of my previous gatherings. This was determined by Mr. E. Nelmes as *Carex flava* L. and is also new to the county. It was previously known for certain only in Roudsea Wood, N. Lancashire (V.C. 69b), so that this is its second known occurrence in the British Isles.—G. A. Shaw.

# THE DISTRIBUTION OF *RHAGIUM BIFASCIATUM* F. AND ITS ABERRATIONS IN THE BRITISH ISLES

RAYMOND R. U. KAUFMANN

*Rhagium bifasciatum* F. is certainly the most widely distributed Longicorn beetle in these islands, and although there are still a number of counties and vice-counties in the country which remain to be more thoroughly explored entomologically, and



from which there are as yet no published records, there can be little doubt that the species will eventually turn up in them.

A somewhat local insect, and usually quite common, often abundant where it occurs, *R. bifasciatum* may be sought for successfully throughout the year, and there are records for it from January to December. It undoubtedly prefers decaying Scots pine logs and stumps, but it has also been taken from dead firs, larch, spruce, ash, oak, beech, birch, hornbeam, alder, mountain ash and willow. It may be beaten in the early summer from freshly-cut fir and pine branches, dogrose, apple and hawthorn blossom, rhododendron flowers and umbellifers, and more occasionally it emerges from old posts and palings. It is best captured during the spring

months, just prior to its emergence from the wood, and for this purpose the latter is best broken up with a trowel and crowbar, for the cells are always close to the surface of the stump and roots.

The species is a very variable one, and of the many aberrations described, the majority occur with us. The following emended key should assist in their identification. The percentage of aberrant forms present with the type varies, naturally, to a great extent, but it is often quite high.

#### KEY TO THE ABERRATIONS OF *Rhagium bifasciatum* F.

(Bracketed numbers link contrasting forms.)

- I. Yellow fasciae reduced. Ground colour largely bronze-black. Marginal red remains normal. Anterior spots divided, reduced or wanting.
  1. Posterior spots absent.——*a. infasciatum* Pic, 1898 (3).
  2. Posterior spots divided and greatly reduced.——*a. blairi* Kaufm., 1944 (1).
  3. Posterior spots whole and only slightly reduced.——*a. bistrinotatum* Pic, 1914 (2).

Marginal red more conspicuous and

  4. Encroaches upon apical third of elytra. Anterior spots whole, posterior spots obliterated.——*a. unifasciatum* Muls., 1839 (5).
  5. Spreads from apex almost to anterior spots. Posterior spots slightly reduced or divided.——*a. deyrollei* Pic, 1910 (4).
  6. Completely spread over elytra, except for basal and apical thirds.——*a. bicolor* Oliv., 1795 (15).
  7. Spreads completely over elytra, except for extreme base.——*a. rufum* Prell., 1908 (19).
- II. Yellow fasciae enlarged but not confluent. Ground colour largely bronze-black. Marginal red normal. Anterior spots dentate along lower edge, smoother above.
  8. Posterior spots rounded along upper edge. Elytral apex broadly red.——*a. latefasciatum* Pic, 1891=*a. fasciatum* Pic, 1898 (9).

Apex of elytra less broadly red.

  9. Posterior spots strongly dentate along both edges. Raised lines on elytra very shiny and conspicuously black against the pubescent background.——*a. dentatofasciatum* Kaufm., 1945 (8).
  10. Posterior spots extend towards apex.——*a. lituratum* Fugn., 1891 (11).
  11. Both anterior and posterior spots spread respectively towards base and apex. Centre of elytra darkly cruciform.——*a. mediofasciatum* Pic, 1912 (10).
- III. Yellow fasciae enlarged and confluent. Marginal red normal. Anterior spots produced to meet posterior spots along suture.
  12. Connection narrow.——*a. gravei* Hubenth., 1902 (13).
  13. Connection broad.——*a. connexum* Everts, 1918 (12).
  14. Connection interrupted by elongated black spots.——*a. nigrolineatum* Donovan, 1801=*a. medionotatum* Pic, 1910 (18).
  15. Connection complete and spread across elytral centre.——*a. ornatum* F., 1775=*a. dorsale* Marsham, 1802=*a. ecoffeti* Muls., 1839 (6).

Marginal red narrower. Basal third of elytra broadly dark. Yellow extends to elytral apex.

  16. Connection between spots narrower and flanked by a dark patch. With a small subsutural spot.——*a. bimaculatum* Marsham, 1802 (17).
  17. Connection broad and complete. Apical two-thirds of elytra broadly yellow.——*a. simoni* Blair, 1940 (16).
  18. Like the preceding, but with two black median lines, the longer nearer to the suture. Occasionally with traces of a third line by the elytral margin or at the apex.——*a. virgatum* Kaufm., 1945 (14).
  19. Extreme base only dark. Elytra almost wholly yellow.——*a. ictericum* Schleicher, 1924=*lelisi* Deyr., 1935 (7).

Of these forms, the third group is by far the most common, the dark varieties with the reduced maculations are extremely rare, and very few records exist for those in which the red coloration predominates.



## DISTRIBUTION OF THE TYPE FORM

ENGLAND.—BD : near Leighton Buzzard, Apsley Guise ; BK : Reading, Sunningdale, Crowthorne, Wellington College, Windsor Forest ; BX : localities not specified ; CB : Cambridge Wood Ditton ; CH : Bidston, Broxton Old Hall, Delamere Forest, Dunham Park, Eastham Woods, near Mollington, Oakmere, Pettypool Wood, Staley Brushes, Storeton ; CU : Barron Wood, Carlisle, Durdar, Hellvellyn, Keswick, Kingsmoor, near Latrigg, Orton, Skirwith ; DM : Gidside, Winlaton-on-Tyne, Castle Eden Dene ; DT : Bloxworth, Charmouth, Parkstone, Wootton Wood, Morden, Upper Bockhampton ; DY : Bakewell, near Scalpscliff Hill ; EC : Fowey, Looe, Probus ; EK : Blean Woods, Chatham, Holly Hill, Lordswood ; EN : Brundall, Dilham, Horning, Horning Ferry, Horsford, Weybourne Wroxham ; ES : Barnby Broad, Belton Bog, Bentley Woods, Frostenden ; EX : Eastbourne, Fairlight, Hastings, Sedlescombe ; EY : Byland, Coxwold, Pickering, Eller Beck, Eston, Harwood Dale, Ingleby Greenhow, Kildale, Langdale End, Strensall Common, West Ayton, West Beck, Wykeham ; GE : Greenway ; GW : Forest of Dean, Staunton ; HF : Dinsmore Hill, Bishopstone, Black Mountain ; HT : Rickmansworth ; IW : Marvel Copse, Newport, Parkhurst Forest ; L : London ; LN : Grimbsy, Lincoln, Linwood, Louth ; LR : Bardon Hill, Bradgate Park, Buddon Wood, Charnwood Forest, Gibson's Gorse, Owston Wood ; MM : Priory Grove Wood ; MY : Bardon Fell, Bolton Woods, Harrogate, Leckby Carr, Pannal, Pannal Ash, Rawdon, Scarcroft, Scotland Wood, Tanfield ; ND : Bow, Braunton, Westward Ho ! ; NE : Great Horkesley, Theydon Bois ; NH : Crookham, Pamber ; NM : Manor Hills, Retford, Sherwood Forest, Thieves Wood ; NN : Lyham ; NO : Bedford Purlieu Wood, Duddington, Wansford ; NS : Sharpsham, Stratton-on-the-Fosse ; NY : Deepdale ; OX : no localities detailed, but common ; SD : Broadwell, Combe Raleigh, Devon Great Consols. Mine, Dumpdon Hill, Dunsford, Ermington, Exeter, Haldon, Shute Park, Stoke Wood ; SE : Epping and Hainault Forests ; SH : West Wellow, Baddesley, Brockenhurst, Denny Wood, Jones' Inclosure, Lyndhurst, New Forest, Southampton ; SL : Manchester ; SN : Meldon Park, Healey ; SP : Clun ; SR : Byfleet, Croydon, Dorking, Esher Common, Farley Heath, Hindhead, Hurt Wood, Leith Hill, Mytchett, Ockham Common, Oxshott, Peaslake, Shere, Ewhurst ; SS : Bathealton ; ST : Cannock Chase, Hawksmoor Nature Reserve, Madeley, near Scalpscliff Hill (on the Stafford side), Swynnerton Old Park ; SW : Market Lavington ; SY : Brough, Market Weighton ; WC : Lelant Wood, The Lizard, Trelissick Wood ; WK : Bromley, Cobham Great Park, Darenth Wood, East Malling, Oaken Wood, Sevenoaks, Westerham ; WL : Cartmel Fell, Melkinthorpe, Rydalwater, Ullswater ; WO : Areley Wood, Bewdley Forest, Dine's Green ; WW : Brandon, Corley, Edgbaston, Sutton Park, Monks Park Wood ; WX : Marley, Pullborough ; WY : Barnsley, Bramley, Doncaster, Gunthwaite, Lower Cliff Wood, Meltham, Wakefield, Wharnccliffe Woods.

WALES.—CD : Aberystwyth, Penglais Hill ; CR : Snowdon ; GM : Castell Coch, Swansea ; PB : Cannaston Woods, Tenby ; RA : Llandridnod Wells.

SCOTLAND.—AM : Dunoon ; AS : Bielside, Braemar, between Coultau and Culter, Cults ; AY : Fullarton Woods, Kilmarnock ; B : Bute ; BW : Pease Bridge ; DF : near Gretna, Raehills ; ED : Crichton, near Edinburgh, Rosebery Reservoir, Roslin ; EI : Aviemore, Boat of Garten, Kingussie, Nethy Bridge, Newtonmore, Rothiemurchus Forest ; EL : Darnaway Forest, near Forres ; FF : North Esk ; LA : near Glasgow ; LL : Almond Valley ; PC : Dollar ; PM : Killin, Loch Tummel, Rannoch ; RE : Fortrose ; RF : Inverkip ; SG : Ben Lomond, Loch Watston ; SK : near Galashiels ; SS : Golspie, Invershin.

IRELAND.—DO : Newcastle ; DU : Glenasmole ; ED : Foyle Valley ; LD : Walworth Wood ; NG : Clonbrock ; NK : Killarney, Muckross ; SK : Rossbeigh ; WA : Cappoquin, Lismore ; WC : Glengarriff, Timoleague ; WI : Avoca, Devil's Glen, Powerscourt, Rathdrum. Records also exist from the following counties, without further data : Antrim, Clare, Carlow and Louth.

## ABERRATIONS

*a. infasciatum* Pic—Bayford's Wakefield specimen is to be referred to *a. ictericum* Schleicher ; Kaufmann's records to *a. simoni* Blair ; EI : Nethy Bridge.

*a. blairi* Kaufm.—CH : Oakmere.

*a. bistrinotatum* Pic—CH : Oakmere.

- a. unifasciatum* Muls.—CD : Aberystwyth (C. Morley), June, 1939.  
*a. deyrollei* Pic—a specimen *sine data* in Coll. Mus., Manchester.  
*a. bicolor* Oliv.—Walsh's Pickering and Cross Cliff examples are probably *a. ornatum* F.  
*a. latefasciatum* Pic—CH : Oakmere ; SR : Boxhill, Oxshott ; PM : Rannoch.  
*a. dentatofasciatum* Kaufm.—BK : Easthampstead Park ; CH : Oakmere ; SR : Mytchett.  
*a. lituratum* Fugn.—CH : Delamere Forest and Oakmere.  
*a. mediofasciatum* Pic—ND : Lynmouth.  
*a. gravei* Hubenth.—SH : New Forest ; SR : Oxshott, Woking ; ST : Chartley Moss.  
*a. connexum* Everts—BK.—Wellington College ; SH : New Forest ; SR : Oxshott, Woking ; ST : Chartley Moss ; WO : Wyre Forest.  
*a. nigrolineatum* Donovan—BK : Windsor ; CH : Oakmere, Pettypool Wood ; HT : Rickmansworth ; IW : Niton ; SH : New Forest ; SL : Manchester ; SR : Hurt Wood ; ST : Cannock Chase ; WY : Huddersfield.  
*a. ornatum* F.—CH : Oakmere ; EK : Deal ; EY : Cross Cliff, Pickering ; SH : Denny Wood, New Forest ; SL : Manchester ; SR : Hurt Wood, Weybridge.  
*a. bimaculatum* Marsham—there is a specimen in the collection at the British Museum, but without further data. Bayford's (1940) example is to be referred, I believe, to *a. ictericum* Schleicher ; it is possibly a Yorkshire insect.  
*a. simoni* Blair—CH : Oakmere ; MY : Pannal Ash ; SD : Devon Great Consols. Mine ; SH : New Forest ; SR : Ash ; WW : Kenilworth.  
*a. virgatum* Kaufm.—CH : Oakmere ; SH : New Forest.  
*a. ictericum* Schleicher—SH : New Forest ; SR : Albury, Hurt Wood, Leith Hill ; WY : Wakefield. A specimen in the British Museum collection bears the label, N. of England. EI : recorded from this vice-county, without further particulars ; PM : Killin.

There are still some notable gaps in the Britannic distribution of the species, as will be seen from the accompanying map. In the north, nothing is known of it from mid-Lancashire, in the east it remains to be recorded from South Lincolnshire, Huntingdon and Western East Anglia ; it has not yet been found in Middlesex or North Wiltshire. Many counties in Wales, where it should occur, still require exploration\* ; in Scotland also, though *R. bifasciatum* has been described from many regions, our knowledge of its range there is incomplete. Only the coastal counties of Ireland seem to have been worked for this species, but it must surely occur elsewhere in the west and the central plains.

Explanation of county and vice-county symbols :

England : BD—Beds., BK—Berk., BX—Bucks., CB—Cambs., CH—Ches., CU—Cumberland, DM—Durham, DT—Dorset, DY—Derbyshire, EC—E. Cornwall, EK—E. Kent, EN—E. Norfolk., ES—E. Suffolk., EX—E. Sussex, EY—N.E. Yorks., GE—E. Glos., GW—W. Glos., HF—Herefordshire, HT—Herts., IW—I. of Wight, L—London county, LN—N. Lincs., LR—Leics. and Rutland, MM—Monmouthshire, MY—Mid-W. Yorks., ND—N. Devon, NE—N. Essex, NH—N. Hampshire, NM—Notts., NN—N. Northumberland, NO—Northants., NS—N. Somerset, NY—N.W. Yorks., OX—Oxon., SD—S. Devon, SE—S. Essex, SH—S. Hants., SL—S. Lancs., SN—S. Northumberland, SP—Salop, SR—Surrey, SS—S. Somerset, ST—Staffs., SW—S. Wilts., SY—S.E. Yorks., WC—W. Cornwall, WK—W. Kent, WL—N.W. Lancs. and Westmorland, WO—Worcs., WW—Warwicks., WX—W. Sussex, WY—S.W. Yorks. Wales : CD—Cardiganshire, CR—Caernarvonshire, GM—Glam., PB—Pembroke, RA—Radnor. Scotland : AM—Main Argyll, AS—S. Aberdeen, AY—Ayrshire, B—Bute, BW—Berwicks., DF—Dumfriess., ED—Edinburgh, EI—E. Inverness, EL—Elgin, FF—Forfar, LA—Lanarks., LL—Linlithgow, PC—S. Perth and Clackmannan, PM—Mid-Perth, RE—E. Ross, RF—Renfrew, SG—Stirling, SK—Selkirk, SS—S. Sutherland. Ireland : DO—Down, DU—Dublin, ED—E. Donegal, LD—Londonderry, NG—N. Galway, NK—N. Kerry, SK—S. Kerry, WA—Waterford, WC—W. Cork, WI—Wicklow.

\* Since these notes were written, the insect has been found in Aberdovey and Cwm-yr-afon, Merioneth.

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We have received one of the 300 duplicated copies of *A Handlist of the Birds of Palestine*, by Capt. Eric Hardy, published by the Education Officer-in-Chief, G.H.Q., Middle East Forces, with a foreword by Lieut.-General J. C. D'Arcy.

In a country where Palaearctic and Ethiopian zoological regions meet, migration routes are followed by many northern species. The principal haunts of birds are mentioned with lists of species seen at each. The classified list which covers 364 species includes data of breeding and other records, with indications of habitat and status. The work of resident and many visiting ornithologists has been drawn upon. A useful bibliography concludes a work which ornithological students visiting Palestine will find of much value ; and in which students of migration will find useful data.—R.C.

# AN EXTENSION OF THE DISTRIBUTION OF LEISLER'S BAT (*Nyctalus leisleri* Kuhl.) IN GREAT BRITAIN.

DAVID L. HARRISON, F.Z.S.

ON 27th May, 1946, I obtained an example of this bat at Hildersham Park, Hildersham, Cambridgeshire. This record extends the known distribution of the bat in Britain considerably to the east. An early record from Norfolk (1838)<sup>1</sup> was considered very doubtful by Barrett-Hamilton (1910)<sup>2</sup>.

The locality includes a lake, with much deciduous woodland, and isolated trees



in the surrounding meadows; a habitat which is, by all accounts, most suitable for this species. Although the animal was flying at the same height as Noctules, which are common there, it was obviously smaller, and the wing beat was shallower and the flight less erratic.

The specimen proved to be a pregnant adult. The colour above is darker brown than in the Noctule and pale below, the fur everywhere is black proximally. The band of fur on the underside of the wing is present, but it must be emphasised that this character is of no use for identifying Leisler's Bat, as it occurs also in the Noctule. The small size is conspicuous and the external and cranial measurements, given below, correspond closely with those of examples in the British Museum Collection, given by Miller (1912)<sup>3</sup>.

## EXTERNAL MEASUREMENTS IN MM.

Specimen	Head and Body	Tail	Fore Arm	Hind Foot	Ear
♂ ad. <i>N. leisleri</i> ... B.M. Coll.	60	39	42	8.2	13
♀ ad., B.M. Coll. ...	63	42	42	8.0	14
♀ ad. Hildersham Coll., D.L.H. ...	64.2	42.5	42.6	9.0	15
♀ ad. <i>N. noctula</i> , B.M. Coll.	71	51	52	10	15

The wing span of this species is given by Morrison-Scott<sup>4</sup> as 289-318 mm. and of *N. noctula* as 353-387 mm. The wing span of this example was 295 mm.

## CRANIAL MEASUREMENTS.

Measurement	♀ ad. Hildersham Coll. D.L.H.	♀ ad. B.M.	♂ ad. B.M.	♀ ad. <i>N.</i> <i>noctula</i>
Condylobasal length	16	16	15.6	18.2
Zygomatic breadth	10.5	10.6	11.0	13.0
Interorbital constriction	5.0	5.0	5.0	5.0
Lachrymal breadth	6.8	7.0	7.0	8.0
Breadth of brain case	8.5	8.6	8.2	9.6
Depth of brain case middle	6 approx	5.2	5.2	6.0
Condylomandibular length	11.5	12.0	12.0	13.8
Maxillary Tooth row	5.8	6.0	6.0	7.0
Mandibular Tooth row	6.1	6.2	6.2	7.6

*Leisler's Bat* has previously been recorded on the mainland from the valley of the river Avon in Warwickshire, Worcestershire and Gloucestershire (*circa* 1874)<sup>2</sup>, the West Riding of Yorkshire (1840, 1874, 1890, 1905, 1907)<sup>2</sup>, Cheshire (1899)<sup>2</sup> and Hampshire (1944)<sup>5</sup>.

The distribution map given shows the present known records of the species in Great Britain; it is proving to be more widespread than was believed. It should be explained that in England each dot denotes a separate record, while in Ireland the dots represent areas in which the species is well known.

I am most indebted to Miss G. M. Rhodes for inviting me to study the bats at Hildersham and also to Mr. T. C. S. Morrison-Scott and to Mr. J. L. Chaworth Musters of the British Museum, Department of Zoology, for confirming my identification, and for much helpful advice.

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## THE SPRING FUNGUS FORAY

W. G. BRAMLEY

TWENTY-ONE members and friends gathered at Thornton-le-Dale from many parts of the country for the spring foray held on April 26th-28th, 1946. Although cold, the rain which promised to spoil the opening day cleared off and fine weather prevailed till the meeting was over. Friday was devoted to Kingthorpe Woods and the activities of the wood-and-bark-fungus hunters resounded through the vale and when in the field this contingent was easy to find. Their progression, however, was snail-like and for three hours on one occasion the total distance travelled was no more than two hundred yards. Kingthorpe provided enough material to keep the experts busy indoors the following day and their only outdoor hunting was a very productive nettle bed close to the village. The remainder of the party explored Ellerburn on this day. The bag was lighter though some interesting material was collected. On Sunday the morning was chiefly devoted to elucidation of material collected, the remainder of the day being spent in Howldale.

Part of one evening was devoted to an exhibition of slides, prepared during the autumn foray of 1945, of some of the interesting hyphomycetes collected at that foray. These included, *Helminthosporium velutinum*, *H. fusisporium*, *H. apiculatum*, 'Monilia aurea Gmelin,' and *Torula ovalispora*, all of which were found again during this foray. An easy method of mounting micro-fungi in lactic acid-cotton blue and of sealing them with a coverslip cement to form semi-permanent preparations was demonstrated. Such an easy method of mounting and sealing should prove invaluable to students of the micro-fungi.

The workroom was a joy to behold, some dozen microscopes being available. For this our sincere thanks are due to Professor Chesters who had brought five with him. Looking back to the paucity of instruments at some of our past forays we are under a deep debt of gratitude to all who brought microscopes and books. To Dr. Grainger and Mr. Broadbent must also go praise for providing excellent lighting arrangements. Finally we are all extremely grateful to our hostess who, under exceptional difficulties, looked after the inner man and managed to feed the hungry hoard who descended on the dining room.

The following list of species collected is compiled mainly from contributions from Professor Chesters, E. W. Mason and his colleagues from the herbarium I.M.I., A. A. Pearson, P. H. B. Talbot, W. G. Bramley, and A. Broadbent. A number of specimens with slides have been received from the herbarium I.M.I. and are now deposited in the Yorkshire Museum at York. These are indicated in the list by a preceding number and are distinguished in the herbarium by the serial YNU/466/1, etc.

†=Not in *Catalogue of Yorkshire Fungi*.

\*=Not in V.C. 62.

M. & G.=Mason and Grainger, *Catalogue of Yorkshire Fungi*.

K.=Kingthorpe Wood.

E.=Ellerburn.

H.=Howldale.

T.=Thornton-le-Dale.

The list is arranged in alphabetical order under the larger groups.

Mr. E. W. Mason writes: The following records are of interest. On wood of *Sorbus aucuparia* hysterothecia of *Farlowiella carmichaeliana* have at last been found in Yorkshire and in the characteristic habitat—in association with *Sporocybe flexuosa*: conidia of the *Farlowiella* were found growing on the *Sporocybe* synnemata. The conidia were described from Yorkshire first by Massee in 1885 as *Helminthosporium pumilum* and the fungus was stated to be parasitic on synnemata of *Stilbum flexuosum*.

Dead trunks of *Sorbus* in Howldale Woods also provided fine collections of *Eutypella sorbi*, and in the same locality *Lasiosphaeria strigosa* was also abundant.

*Massarina eburnea* appears to be an infrequently collected beech fungus, but it was collected on dead twigs in the woods near Thornton-le-Dale.

The new records from Yorkshire also include the hyphomycetes *Cephalotrichum curtum*, found on dead *Juncus* (?) and *Phaeoisaria cornui* on a dead twig of *Sambucus*. *P. cornui* was first recorded for Britain in 1930 near Bristol (sub. *Graphium fissum* Preuss.).

*Sporoschisma mirabile* and *Clasterosporium fasciculare*, the latter new to Yorkshire lists, deserve a special mention; they were found together on the same

decaying log of *Sorbus*. The records for *Hypoxylon coccineum* on *Corylus* and *Crataegus* would, according to Miller's treatment of the group, be placed under *H. howeanum*.

## MYXOMYCETES

- |  |                                    |
|--|------------------------------------|
| <i>Didymium squamulosum</i> Fr. K.         | <i>Trichia affinis</i> de Bary. K. |
| <i>Hemitrichia clavata</i> Rost. H.        | <i>T. botrytis</i> Pers. H.        |
| <i>Perichaena corticalis</i> Rost. K., H.  | <i>T. persimilis</i> Macbr. K.     |
| <i>Reticularia lycoperdon</i> Bull. K., E. | <i>T. scabra</i> Rost. K.          |
|  | <i>T. varia</i> Pers. K., E., H.   |

## PHYCOMYCETES

- |   |   |
|---|---|
| * <i>Peronospora ficariae</i> Tul., on <i>R. ficaria</i> . K. | * <i>Plasmopara pygmaea</i> (Unger.) Schroet., on <i>Anemone</i> . K. |
| <i>P. grisea</i> Unger., on <i>V. beccabunga</i> . E.         |   |

## DISCOMYCETES

- |  |   |
|--|---|
| <i>Calloria fusarioides</i> (Berk.) Fr., on stems of <i>Urtica</i> . K., E.    | <i>Propolis versicolor</i> (Fr.) Fr., on <i>Fagus</i> . K. (M. and G. sub. <i>P. faginea</i> ).                 |
| <i>Dasyscypha nivea</i> (Fr.) Sacc. K., E.                                     | <i>Polydesmia pruinosa</i> (Berk. and Br.) Boud., with <i>D. stigma</i> (M. and G. sub. <i>Belonidium</i> ). K. |
| <i>D. virginea</i> (Batsch.) Fuckel. K.  | <i>Pseudopeziza petiolaris</i> (A. and S.) Mass., on petioles of <i>Acer</i> . (det. Kew). E.                   |
| <i>Dermatea cerasi</i> (Pers.) de Not., on <i>Prunus cerasus</i> . H.          | <i>Rhytisma acerinum</i> (Pers.) Fr. ex Fr. K., E.  |
| <i>Disciotis venosa</i> (Pers. ex Fr.) Boud. E.                                | <i>Sclerotinia curreyana</i> Karst., on <i>Juncus articulatus</i> . K.  |
| <i>Heterosphaeria patella</i> (Tode.) Grev. E.                                 | <i>Stegia ilicis</i> Fr. K.   |
| <i>Hyaloscypha hyalina</i> (Pers. ex Fr.) Boud. K.                             | <i>Tapesia fusca</i> (Pers.) Fuckel, on <i>Alnus</i> . E.   |
| <i>Lachnella sulphurea</i> (Pers.) Quel. E.                                    | <i>T. willkommii</i> (Hartig), on <i>Larix</i> . E. (det. Kew).   |
| <i>Mollisia cinerea</i> (Batsch.) Fr. K., H., E.                               | <i>Velutaria rufo-olivacea</i> (A. and S.) Fuckel, on <i>Fraxinus</i> (det. Kew). E.                            |
| <i>M. ligni</i> (Desm.) Karst. (det. Kew). = ( <i>M. lignicola</i> Phill.). E. |   |
| <i>Morchella esculenta</i> Pers. K.  |   |

## PYRENOMYCETES

- |  |  |
|--|--|
| 2 <i>Dialonectria peziza</i> (Fr.) Cooke, on <i>Acer</i> . T.  | <i>Bertia moriformis</i> (Fr.) de Not., on <i>Sambucus</i> . K.  |
| <i>D. sanguinea</i> (Bolt. ex Fr.) Cooke, on <i>Crataegus</i> , K; with <i>D. stigma</i> on <i>Fagus</i> , T.; with <i>Anthostoma</i> on <i>Fagus</i> , T. | <i>Calospora platanoides</i> (Pers.) Niessl, on <i>Acer</i> . K., T.   |
| 8 <i>Nectria aquifolii</i> (Fr.) Berk., on <i>Ilex</i> . K.  | * <i>Calyculosphaeria tristis</i> (Fuckel) Fitzp., on <i>Ulmus</i> (M. and G. sub. <i>Nitschkia</i> ) with <i>D. stigma</i> . K.         |
| <i>N. cinnabarina</i> (Tode. ex Fr.) Fr., <i>Acer</i> , <i>Crataegus</i> , <i>Sorbus aucuparia</i> , <i>Ulmus</i> . K., E.                                 | <i>Chaetosphaeria innumera</i> Tul., on <i>Sorbus aucuparia</i> . H.   |
| <i>N. coccinea</i> (Pers. ex Fr.) Fr., on <i>Fagus</i> , <i>Ulmus</i> . K., H.   | 17 <i>C. phaeostroma</i> (D. and M.) Fuckel, with <i>D. stigma</i> on <i>Ulmus</i> , with <i>Eutype flavovirens</i> on <i>Fagus</i> . K. |
| † <i>N. coryli</i> Fuckel, on <i>Salix</i> (det. T. Petch). E.   | † <i>Clypeosphaeria notarisii</i> Fuckel, on <i>Rosa</i> . K.  |
| * <i>N. punicea</i> (K. and S. ex Fr.) Fr., on <i>Fagus</i> . K.   | <i>Cryptosphaeria eunomia</i> (Fr.) Fuckel, on <i>Fraxinus</i> (M. and G. sub. <i>Valsa</i> ). K.  |
| <i>N. sinopica</i> (Fr.) Fr., on <i>Hedera</i> . K., T.  | <i>Cryptospora suffusa</i> (Fr.) Tul., on <i>Alnus</i> . E.  |
| 1 <i>Anthostoma turgidum</i> (Pers. ex Fr.) Nits., on <i>Fagus</i> . K., H.  | <i>Cucurbitaria berberidis</i> (Fr.) Grev., on <i>Mahonia</i> . K.   |
| <i>Berlesiella nigerrima</i> (Curr.) Sacc., on <i>Fagus</i> with <i>D. stigma</i> . K.   | <i>Daldinia concentrica</i> (Bolt. ex Fr.) Ces. and de Not., on <i>Fraxinus</i> . K.   |

## PYRENOMYCETES—continued

- Didymella tosta* (B. and Br.) Sacc., on *Epilobium angustifolium*. K., E.
- †*Ditopella ditopa* (Fr.) Schroet., on *Alnus*. E.
- †*Diaporthe eres* Nits., on *Hedera*. T.
- 3*D. leiphaemia* (Fr.) Sacc., on *Quercus*. K., E.
- 4\**Diatrype bullata* (Hoffm. ex Fr.) Fr., on *Salix*. E.
- D. disciformis* (Hoffm. ex Fr.) Fr., on *Fagus*. K.
- D. stigma* (Hoffm. ex Fr.) Fr., on *Acer*, *Crataegus*, *Fagus*, *Fraxinus*, *Quercus*, *Ulmus*. K., E., T., H.
- 7†*Didymosphaeria epidermidis* (Fr.) Fuckel, on *Epilobium angustifolium*. K.
- Diatrypella favacea* (Fr.) Ces. and de Not., on *Alnus*, *Betula*, *Corylus*, *Fagus* (M. and G. sub. *D. verruciformis*). K., E.
- Diatrypella quercina* (Fr.) Cooke, on *Quercus*. K.
- †*Eutypa flavovirens* (Fr.) Tul., on *Acer*, *Fraxinus*, *Fagus*. K.
- Eutypella prunastri* (Fr.) Sacc., on *P. spinosa* (M. and G. sub. *Valsa*). K.
- †*E. sorbi* (Fr.) Sacc., on *Sorbus aucuparia*. K., H.
- E. stellulata* (Fr.) Sacc., on *Ulmus*. K.
- Farlowiella carmichaeliana* (Berk.) Sacc., on *Sorbus aucuparia*. H.
- †*Helminthosphaeria corticiorum* v. Hohn., on *Peniophora crenea*. K.
- Hypoxylon coccineum* Bull., on *Corylus*, *Crataegus*, *Fagus* (see note above). K.
- H. fuscum* (Pers. ex Fr.) Fr., on *Corylus*. K., E.
- 5*H. multifforme* (Fr.) Fr., on *Alnus*, *Betula*. K., E.
- H. rubiginosum* (Pers. ex Fr.) Fr., on *Fagus*, *Fraxinus*. K.
- Hypoxylon semi-immersum* Nits., on *Quercus*. K.
- H. serpens* (Pers.) Fr. K.
- Hysterium pulicare* Pers. ex Fr., on *Hedera*. T.
- 6*Lasiosphaeria hirsuta* (Fr.) Ces. and de Not., on *Sorbus*. K.
- L. ovina* (Fr.) Ces. and de Not., and *L. spermoides*, on wood with rhizomorphs of *Armillaria mellea* (M. and G. sub. *Leptospora*). K.
- †*L. strigosa* (A. and S. ex Fr.) Sacc., on *Fagus*, *Sorbus*, *Ulmus*. H.
- Leptosphaeria acuta* (M. and N.) Karst., on *Urtica*. K., T., E.
- †*L. derasa* (B. and Br.) Auersw., on *Senecio Jacobaea*. K., E.
- L. doliolum* (Pers. ex Fr.) de Not. K.
- †*Massarina eburnea* (Tul.) Sacc., on *Fagus*. T.
- Ophiobolus acuminatus* (Sow.) Duby, on *Cirsium*. K., E.
- Pleospora herbarum* (Pers. ex Fr.) Rab., on *Arctium*. K.
- \**Quaternaria dissepia* (Fr.) Tul., on *Ulmus*. K.
- Q. quaternata* (Fr.) Schroet., on *Fagus*. K.
- Rosellinia aquila* (Fr.) de Not., on *Cornus*, *Fagus*, *Fraxinus*. K.
- †*R. ligniaria* (Grev.) Nits., on *Fagus*. K.
- \**R. velutina* Fuckel, on *Fagus*. K.
- Rhopographus filicinus* (Fr.) Fuckel, on *Pteridium*. E.
- Ustilina vulgaris* Tul., on *Fagus*. K.
- Valsa ambiens* (Pers. ex Fr.) Fr., on *Acer* (M. and G. sub. *Diaporthe*). T.
- Xylaria carpophila* (Pers.) Fr., on Beech mast. T.
- X. hypoxylon* (Linn.) Fr. K., E.
- 19*X. polymorpha* (Pers. ex Fr.) Grev. K.

## UREDINALES

- Puccinia adoxae* Hedw., III. H.
- P. baryi* Wint., III, on *Brachypodium sylvaticum*. K., E.
- P. betonicae* DC., O. K.
- \**P. chaerophylli* Purt., OI on *Anthriscus* and *Myrrhis*. H., E.
- P. fusca* Wint., III. K.
- P. graminis* Pers., III, on *Agropyron repens*. T.
- \**P. holcina* Erikss., II, III, on *H. mollis*. K.
- †*Puccinia mirabilissima* Peck., II, III, on *Mahonia*. T.
- Puccinia obtogens* Tul., OII, on *C. arvense*. K., T., E.
- P. poarum* Niels., OI, on *Tussilago*. T.
- P. pulverulenta* Grev., OI, on *E. hirsutum*. E.
- Puccinia saniculae* Grev., II, III. K., T.
- P. tumida* Grev., III. K.
- P. variabilis* Grev., OI, on *Taraxacum*. T.
- P. violae* DC., OI, on *V. hirta* and *Riviniana*. T.

## UREDINALES—continued

*Phragmidium sanguisorbae* Schroet.,  
I. H.  
*P. violaceum* Wint., I, II, III, on  
*Rubus fruticosus*. E.  
*Uromyces ficariae* (Schum.) Lev.,  
III. K.

*Uromyces poae* Rab., OI, on *R. ficaria*.  
K., E.  
*U. scillarum* (Grev.) Wint., III.  
K.  
*Urocystis anemones* (Pers.) Wint.,  
on *Anemone*. K.

## BASIDIOMYCETES

*Auricularia auricula-judae* (Linn.)  
Schroet. K.  
*Armillaria mellea* (Vahl.) Fr.  
*Bolbitius vitellinus* (Pers.) Fr.  
*Bovista nigrescens* Pers., in pastures.  
E.  
*Coprinus micaceus* (Bull.) Fr. K.  
*C. plicatilis* (Curt.) Fr. T.  
\**Corticium albostramineum* Bres., on  
*Fagus*. K., H.  
*C. botryosum* Bres. E.  
*C. comedens* (Nees) Fr. K.  
*C. lactescens* Berk. E.  
*C. laeve* (Pers.) Quel. K.  
†*C. pelliculare* Karst. var. K.  
*C. porosum* Berk. and Curt. K.  
*C. praetermissum* Karst. H.  
*C. sambuci* (Pers.) Fr., on *Sambucus*.  
K.  
*Cyphella capula* (Holmsk.) Fr. K.  
*Dacryomyces deliquescens* (Bull.)  
Duby. K., E., H.  
*Exidia glandulosa* (Bull.) Fr., on  
*Fagus*, *Quercus*. K.  
*E. nucleata* (Schwein.) Rea. K.  
†*E. thuretiana* (Lév.) Fr. H.  
*Fomes ferruginosus* (Schrad.) Mass.  
K.  
*Grandinia farinacea* (Pers.) Bourd.  
and Galz. K.  
\**G. brinkmanni* (Bres.) Bourd. and  
Galz. H.  
*Hymenochaete rubiginosum* (Dicks.)  
Lév. K.  
*Irpex obliquus* (Schrad.) Fr. K., E.  
*Merulius corium* (Pers.) Fr., on  
*Fraxinus*. H.

*Mycoleptodon fimbriatum* (Pers.)  
Bourd. and Galz. H.  
*Peniophora caesia* (Bres.) Bourd.  
and Galz. K.  
*P. cinerea* (Fr.) Cooke. K.  
*P. cremea* Bres. K.  
*P. glebulosa* (Fr.) Bres. H.  
*P. hydroides* Cooke and Mass. H.  
*P. pallidula* Bres., ex Bourd. and  
Galz. H.  
*P. quercina* (Pers.) Cooke, on  
*Fraxinus*. H.  
\**P. subulata* (Karst.) v. Hoehn. and  
Litsch. K.  
*Panaeolus campanulatus* (Linn.)  
Fr. T.  
*Polyporus adustus* (Willd.) Fr.  
K., E.  
*P. brumalis* (Pers.) Fr. K.  
*P. squamosus* (Huds.) Fr. H.  
*P. varius* Fr. K.  
*Polystictus versicolor* (Linn.) Fr.  
K., H., E.  
*Psathyra spadiceo-grisea* (Schaeff.)  
Fr. K.  
*Solenia anomala* (Pers.) Fr. K., E.  
*Stereum hirsutum* (Willd.) Fr. K.,  
H., E.  
*S. purpureum* (Pers.) Fr. K.  
*S. rugosum* (Pers.) Fr. H.  
*S. sanguinolentum* (A. and S.) Fr.  
E.  
*Trametes mollis* (Sommerf.) Fr., on  
*Fagus* and *Prunus cerasus*. K., H.  
*Tremella mesenterica* (Retz.) Fr. K.

## FUNGI IMPERFECTI

## COELOMYCETES

*Asterosporium hoffmanni* Kunze, on  
*Fagus*. T.  
*Phoma complanata* (Tode.) Desm.  
K., H., E.

†*Phoma macrocarpa* Trail (det. Kew),  
on old stems of *Mercurialis*. E.  
†*P. urticae*. K., T.  
*Vermicularia dematium* (Pers.) Fr.  
E.

## HYPHOMYCETES

*Botrytis argillacea* Cooke. K.  
*B. cinerea* Pers. ex Fr., under bark  
of *Pinus sylvestris*, K.; var.  
*sclerotiothila* Sacc., on Umbelli-  
ferous stems. K., E.

*Cephalotrichum curtum* Berk., on  
? *Juncus*. K.  
*Cercospora mercurialis* Pass. T.  
†*Clasterosporium fasciculare* (Corda)  
Sacc., on *Sorbus*. H.



## HYPHOMYCETES—continued

- \**Dendryphium curtum* B. and Br., on *Urtica*. T.  
 †*D. griseum* B. and Br., on *Urtica*. T.  
 14\**D. rhopaloides* (Fres.) Berl., on *Arctium* (M. and G. sub. *Helminthosporium*). T.  
 \**Haplaria grisea* Link ex Chev., on wood. T.  
 12\**Helminthosporium apiculatum* Corda K.  
 13†*H. fusisporium* Berk., on *Fagus*, *Fraxinus*, *Quercus*. K., T., H.  
*H. velutinum* Link ex Fr., on *Hedera*. T.  
 †*Menispora tortuosa* Corda, on *Fagus*. K.  
 20*Monilia aurea* Auct., on *Fagus*, *Fraxinus*, *Quercus*, *Sorbus*. K., T.  
*Ovularia obliqua* (Cooke) Oudem., on *Rumex*. K.  
 15\**Periconia byssoides* Pers. ex Corda, on *Urtica* and *Convolvulus*. T.  
 21†*Phaeoisaria cornui* (Bain.) Mason, on *Sambucus*. T.  
 \**Ramularia urticae* Ces., on *Urtica*. T.  
 \**Sarcopodium circinatum* Ehrenb. ex Fr., on *Arctium* (M. and G. sub. *Volutella gilva*). H.  
 \**Sporoschisma mirabile* B. and Br., on *Sorbus*. H.  
*Sporocybe flexuosa* (Mass.) Mason, on *Sorbus* (M. and G. sub. *Graphium*). H.  
*Tilachlidium tomentosum* (Schräd. ex Fr.) Lind., on a *Myxomycete*. T.  
*Torula herbarum* Link ex Fr.  
 10. (a) on sacking. T.  
 9. (c) on stems. T.  
*T. ovalispora* Berk., on *Fraxinus*. K.  
*Trichothecium roseum* Link ex Fr., on *Acer*. T.  
 16†*Verticicladium apicale* (B. and Br.) Sacc., on *Fagus*. K.

## MYCELIA STERILIA

*Ozonium auricomum* Link ex Wallr. K.

## FIELD NOTES

**A Note on the Food of the Water Vole.**—I have had a colony of water voles under observation during this spring, particularly with a view to ascertaining their normal food at this time of the year. A considerable amount of grass appears to be eaten, the bank of the dam in which the colony is situated being clipped as close as a bowling green to a height of about a foot to a foot and-a-half above the water line for a distance of several hundred yards. I watched an old doe biting off the ends of willow branches which trailed in the water. Only the new green shoots were taken. On a subsequent visit I saw a vole feeding on the willow catkins from which the pollen had been shed. It consumed twelve of these before being disturbed by a dog.

Another vole was carrying huge mouthfuls of dried and decayed pieces of rushes across to one side of the dam where she disappeared with them below water, later coming out on the bank to gather some young green shoots which looked at a distance to be water-cress; the latter she brought back with her to the near bank and vanished into a hole. She repeated this two-way collection seven times.

In another nook, where a number of leaves had been washed down into a kind of *cul de sac*, a vole was having a good feed, mainly off sycamore leaves; the vole swam out to catch other leaves which were being brought down by the incoming water.—FRED DEAN.

**Beetles on Dead Nestlings.**—On examining a Song-Thrush's nest in a juniper bush near Aviemore at the end of May this year, I found it to contain dead nestlings and closer examination showed several beetles actively moving about in the nest. Dr. K. C. Crosbie, who was with me at the time, has kindly identified the beetles as being *Silpha thoracica*, *Silpha atrata*, and *Necrophorus vespillo*, all of which, I understand, are more usually found under carcasses lying on the ground. This nest was about three and a half feet above the ground and we wondered if the mud used in the construction of the nest had led the beetles to behave as if they had found the corpses on the ground.—W. F. Fearnley.

## LEPIDOPTERA IN HEBDEN VALLEY, 1945

E. B. GIBSON, D. MILLS AND S. SUNDERLAND

HEBDEN VALLEY has been classical hunting ground for naturalists for more than a century, this district having produced such men as Samuel Gibson, James Needham and John Dewhirst. Not much collecting of Lepidoptera has been done in the valley since one of us (E.B.G.) collected here about 15 years ago. In 1945 collecting was resumed; the results form the subject of this short paper.

'Sugar' was most disappointing, possibly due to the wartime brew, *Triphaena promuba*, the Large Yellow Underwing, and *Xylophasia monoglypha*, Dark Arches, being about the only moths to come to 'Sugar' and even these never in numbers.

'Light' has attracted most visitors: *Triphaena comes*, Lesser Yellow Underwing; *Plusia festucae*, Gold Spot; *P. chrysitis*, Burnished Brass; and *Polychristia moneta*, Golden Plusia; being among those taken. It may be added that 'Light' consisted of an open kitchen window with a 150-watt lamp and a white kitchen table top.

*Abraxas sylvata*, Clouded Magpie, and *Hypena proboscidalis*, the Snout, now occur in numbers but were not recorded by E.B.G. 15 years ago, nor was *Plusia festucae*, Gold Spot, and *Polychristia moneta*, Golden Plusia. 1945 proved to be a 'Plusia' year in the Hebden Valley. The following list is of the Lepidoptera taken by us in Hebden Valley during 1945. It should be noted that collecting was not begun until after 'Sallowing Time,' hence absence of spring moths from the list.

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| <i>Hepialus hectus</i> L.           | <i>Plusia gamma</i> L.                |
| <i>H. lupulinus</i> L.              | <i>Lygris populata</i> L.             |
| <i>H. humili</i> L.                 | <i>L. mellinata</i> F.                |
| <i>Spilosoma lutea</i> Hufn.        | <i>L. dotata</i> L.                   |
| <i>Apetele rumicis</i> L.           | <i>Plemyria bicolorata</i> Hufn.      |
| <i>Cryphia perla</i> Schiff.        | <i>Hydriomena furcata</i> Thunb.      |
| <i>Luperina testacea</i> Schiff.    | <i>Dysstroma truncata</i> Hufn.       |
| <i>Cosmia trapezina</i> L.          | <i>Triphosa dubitata</i> L.           |
| <i>Arenostola pygmina</i> Haw.      | <i>Oporinia autumnata</i> Bork.       |
| <i>Phlogophora meticulosa</i> L.    | <i>Venusia cambrica</i> Curtis.       |
| <i>Xylophasia crenata</i> Hufn.     | <i>Xanthorhoe fluctuata</i> L.        |
| <i>X. monoglypha</i> Hufn.          | <i>X. montanata</i> Schiff.           |
| <i>Apamea unanimis</i> Hueb.        | <i>Calostigia pectinataria</i> Knoch. |
| <i>Celarena secalis</i> L.          | <i>Calostigia didymata</i> L.         |
| <i>Hydraecia micacea</i> Esp.       | <i>Odezia atrata</i> L.               |
| <i>Agrotis segetum</i> Schiff.      | <i>Itama wauria</i> L.                |
| <i>A. ypsilon</i> Rott.             | <i>Cleora rhomboidaria</i> Schiff.    |
| <i>Lycophotia porphyrea</i> Schiff. | <i>Bupalis piniarius</i> L.           |
| <i>Amathes c-nigram</i> L.          | <i>Erannis aurtiaria</i> Esp.         |
| <i>A. xanthographa</i> Schiff.      | <i>E. defoliaria</i> Clerck.          |
| <i>Diarsia festiva</i> Schiff.      | <i>Abraxis grossulariata</i> L.       |
| <i>Triphaena promuba</i> L.         | <i>A. sylvata</i> Scop.               |
| <i>T. comes</i> Hueb.               | <i>Lithina chlorosta</i> Scop.        |
| <i>T. janthina</i> Schiff.          | <i>Cabera pusaria</i> L.              |
| <i>Phalaena typica</i> L.           | <i>C. exanthemata</i> Scop.           |
| <i>Anchoscelis litura</i> L.        | <i>Campea margaritata</i> L.          |
| <i>Agrochola circellaria</i> Hufn.  | Larvæ <i>Deilephila elpenor</i> L.    |
| <i>Antitype chi</i> L.              | Larvæ <i>Saturnia pavonia</i> L.      |
| <i>Leucania pallens</i> L.          | <i>Vanessa atalanta</i> L.            |
| <i>Diataraxia oleracea</i> L.       | <i>V. cardui</i> L.                   |
| <i>Mamestra brassicae</i> L.        | <i>Aglais urticae</i> L.              |
| <i>Hypena proboscidalis</i> L.      | <i>Nymphalis io</i> L.                |
| <i>Polychristia moneta</i> F.       | <i>Lycaena phlaeas</i> L.             |
| <i>Plusia chrysitis</i> L.          | <i>Pieris brassicae</i> L.            |
| <i>P. festucae</i> L.               | <i>P. rapae</i> L.                    |
| <i>P. iota</i> L.                   | <i>P. napi</i> L.                     |
| <i>P. v-aureum</i> Hueb.            |                                       |

We are indebted to W. Lewis Rudland, of Reading, for identifying some of our captures.

## YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1946

## SPURN, June 8th - 10th.

THE Whitsuntide meeting was spoilt by unfavourable weather and our Divisional Secretary, Mr. C. W. Mason, had many other difficulties to overcome, as accommodation promised to him previously was not available when it was required and arrangements had to be made to transport most of the members attending the meeting from and to Hull daily.

On Saturday we went to the Point, but the weather soon turned to rain and little work could be done. Sunday's excursion was to Welwick salt marshes. The day was fine and sunny and in the evening we decided to alter the Monday programme and attempt the outing to Spurn Point again, but the day proved wetter than the Saturday and the insects of these normally dry sandy areas escaped the nets of the entomologists once more.

Those of us who remember Spurn before the war were sorry to find the Warren Cottage buried in Army hutments; other portions of the promontory have similar buildings with much barbed wire, and the new concrete road must take away much of the privacy from the bird population and drive them from their nesting places.

About 40 members attended at one or other of the excursions and 17 Societies responded to the Roll-call at the meeting when Mr. Ralph Chislett, the senior vice-president present, took the chair. More than 20 new members were elected and the thanks of the meeting were given to the landowners and tenants who had given us the necessary permissions and to the Divisional Secretary and the guides, Messrs. Ainsworth and Lord, for the trouble they had taken to make our visit a success.

**Flowering Plants** (W. A. Sledge): The botany of Spurn Head and Kilnsea Warren has been so well investigated that interest chiefly centered in the determination of the extent to which their occupation by the army during the past six years had affected the flora. Despite road construction and the erection of buildings, there does not appear to have been any serious interference with the flora and most of the species known to occur in pre-war days were seen. On bared ground by army huts at Kilnsea Warren Mr. Good detected *Trifolium suffocatum*. A more detailed account of its occurrence and status here will be found elsewhere in this issue. It was accompanied by a few plants of *T. filiforme*, but neither species could be found on adjacent undisturbed ground.

The excursion to Welwick salt marshes and the Humber shore between here and Easington covered less well-worked ground. The salt marsh vegetation, though not yet at its best showed most of the species characteristic of such a habitat. *Cochlearia anglica* is abundant, as noted by the late Mr. J. Fraser Robinson (*Nat.* 1913: 83) and no *C. officinalis* was seen here. On sandy ground a little west and inland from the marshes *Trifolium scabrum* (which still grows in its old station at Spurn Head) was seen growing with *T. striatum*.

The following species were amongst those noted:—

## KILNSEA WARREN AND SPURN HEAD.

- |  |   |
|--|---|
| <i>Sisymbrium orientale</i> L.         | <i>Anthriscus vulgaris</i> Bernh.                   |
| <i>Diplotaxis muralis</i> (L.) DC.     | <i>Caucalis nodosa</i> (L.) Crantz.                 |
| <i>Reseda Luteola</i> L.               | <i>Valerianella olitoria</i> Poll.                  |
| <i>Viola canina</i> L.                 | <i>Picris Echioides</i> L.                          |
| <i>Cerastium semidecandrum</i> L.      | <i>Glaux maritima</i> L.                            |
| <i>C. tetrandrum</i> Curt.             | <i>Centaurium umbellatum</i> Gilib.                 |
| <i>Minuartia Peploides</i> (L.) Hiern. | <i>Calystegia Soldanella</i> (L.) Br.               |
| <i>Claytonia perfoliata</i> Donn.      | <i>Rhinanthus stenophyllus</i> Schur.               |
| <i>Erodium cicutarium</i> L'Hérit.     | <i>Salicornia europaea</i> L. agg.                  |
| <i>Trifolium arvense</i> L.            | <i>Suaeda maritima</i> (L.) Dum.                    |
| <i>T. striatum</i> L.                  | <i>Salsola Kali</i> L.                              |
| <i>T. scabrum</i> L.                   | <i>Hippophae Rhamnoides</i> L.                      |
| <i>T. suffocatum</i> L.                | <i>Ruppia maritima</i> L.                           |
| <i>T. filiforme</i> L.                 | <i>Carex arenaria</i> L.                            |
| <i>Vicia Lathyroides</i> L.            | <i>Ammophila arenaria</i> (L.) Link.                |
| <i>Rubus caesius</i> L.                | <i>Scleropoa rigida</i> (L.) Griseb.                |
| <i>Eryngium maritimum</i> L.           | <i>Poa pratensis</i> L. var. <i>subcaerulea</i> Sm. |
| <i>Apium graveolens</i> L.             | <i>Elymus arenarius</i> L.                          |

## WELWICK SALT MARSHES.

<i>Cochlearia anglica</i> L.	<i>Atriplex littoralis</i> L.
<i>Spergularia salina</i> Presl.	<i>A. Portulacoides</i> L.
<i>S. marginata</i> Kittel.	<i>Salicornia europaea</i> L. agg.
<i>Aster Tripolium</i> L., and var. <i>discoideus</i> Reichb.	<i>Suaeda maritima</i> (L.) Dum.
<i>Limonium vulgare</i> Mill.	<i>Juncus Gerardi</i> Lois.
<i>Armeria maritima</i> (Mill.) Willd.	<i>Triglochin maritimum</i> L.
<i>Plantago maritima</i> L.	<i>Puccinellia maritima</i> (Huds.) Parl.

## GRAVEL PIT AND POND AND FIELDS BEHIND SALT MARSHES.

<i>Ranunculus arvensis</i> L.	<i>Hyoscyamus niger</i> L.
<i>Trifolium arvense</i> L.	<i>Plantago Coronopus</i> L.
<i>T. striatum</i> L.	<i>Allium oleraceum</i> L.
<i>T. scabrum</i> L.	<i>Typha latifolia</i> L.
<i>Vicia tetrasperma</i> (L.) Moench.	<i>Juncus Gerardi</i> Lois.
<i>Myriophyllum spicatum</i> L.	<i>Potamogeton natans</i> L.
<i>Scandix Pecten-veneris</i> L.	

## SEA BANK AND DIKES BETWEEN WELWICK AND KILNSEA.

<i>Minuartia Peplodes</i> (L.) Hiern.	<i>Plantago Coronopus</i> L.
<i>Spergularia salina</i> Presl.	<i>Juncus Gerardi</i> Lois.
<i>Eryngium maritimum</i> L.	<i>Scirpus maritimus</i> L.
<i>Artemisia maritima</i> L.	<i>Carex divisa</i> Huds.
<i>Glaux maritima</i> L.	<i>Pholurus (Lepturus) filiformis</i> (Roth.) Schinz. and Thell.
<i>Samolus Valerandi</i> L.	

**Mosses** (A. Thompson) : Though the number of bryophytes occurring in the vicinity of Spurn Point seems to be small, some of them are interesting.

*Tortula ruraliformis* Dixon, and *Brachythecium albicans* B. and S., were very abundant on the sandy parts. They are not common in most Yorkshire districts, their habitat being usually restricted to sand-hills near the sea. *Bryum pendulum* Schp., though its range is not so narrow, grows well in similar situations; it was found sparingly on Spurn. *Hypnum aduncum* Hedw., was only noticed at one place, in a small pool behind the sea-embankment between Welwick and Easington. A rather rare form of *Bryum argenteum* L., namely var. *lanatum* B. and S., was picked up in Welwick gravel-pits. *B. atropurpureum* W. and M., not very common in the county, was fruiting abundantly in the hollows among the sand-hills.

Later, when going through the packets of mosses gathered on the sand-hills, I found a tuft that had not been examined. This proved to be *Trichostomum flavovirens* Bruch., which has not previously been recorded for Yorkshire. It is a common moss in some of the southern counties in similar situations to that on Spurn and it has been found all the way up to the north of Scotland so that it is surprising that no one had previously discovered it in our county.

Other plants common in most parts of Britain that occurred only sparingly about Spurn were : *Barbula fallax* Hedw., *B. cylindrica* Schp., *Funaria hygrometrica* Sibth., *Bryum inclinatum* Bland., *Brachythecium purum* Dixon, *Eurhynchium Swartii* Hobk., a large form of *Hypnum cupressiforme* L., and *H. Schreberi* Willd. Common mosses that were abundant were : *Ceratodon purpureus* Brid., *Bryum capillare* L., *Brachythecium rutabulum* B. and S., and *Eurhynchium praelongum* Hobk.

The hepatic *Lophocolea bidentata* (L.) Dum., was intermixed with some of the mosses in damper situations.

**Fungi** (W. G. Bramley) : Collecting on this excursion was necessarily restricted to herbaceous material, chiefly of groups which are not being worked much in Yorkshire at the present time, and a number of new records were made, mostly in the Pyrenomycetes. For the identification of these I am much indebted to Dr. Dennis of the Kew Herbarium.



\* New to VC. 61. † Not in Catalogue of Yorkshire Fungi.  
S.=Spurn. W.=Welwick.

## PHYCOMYCETES

- Cystopus candidus* (Pers.) de Bary, on *Capsella*. W. \**Peronospora parasitica* (Pers.) Tul., on *Capsella*. W.  
*Peronospora effusa* (Grev.) Rab., on *Chenopodium* sp. W. \**Empusa muscae* Cohn., on flies. S.

## ASCOMYCETES

- \**Erysiphe graminis* DC., on *Dactylis*, *Agropyron*, *Hordeum*. S., W. †*Leptosphaeria derasa* (B. and Br.) Thüm., on *Senecio*. S.  
†*Dasyscypha controversa* (Cke.) Rehm., on *Phragmites*. W. †*L. libanotis* (Fuekel) Niessl, on *Daucus*. S.  
\**Lachnella sulphurea* (Pers.) Quel., on *Heracleum* stems. W. *Ophiobolus acuminatus* (Sow.) Duby, on *Cirsium*. S., W.  
\**Calloria fusariodes* (Berk.) Fr., on *Urtica* stems. W. *O. fruticum* (Rob. and Desm.) Sacc., on *Ononis*. W.  
*Lophodermium arundinaceum* (Schrad.) Grev., on *Phragmites*. W. \**O. rubellus* (Pers. ex Fr.) Sacc., on *Conium*. S., W.  
*Chaetomium elatum* Kunze, on Straw. W. *Pleospora herbarum* (Fr.) Rab., on *Conium*, *Aster*, *Faba*. S., W.  
†*Cucurbitaria dulcamarae* (Kunze et Schm. ex Fr.) Fr., on *Solanum*. S. †*Diaporthe arctii* (Lasch.) Nits., on *Conium*. W.  
†*L. arundinacea* (Sow. ex Fr.) Sacc., on *Phragmites*. W. †*D. arctii* var. *achillae* (Auersw.) Wehm., on *A. millefolium*. W.

## BASIDIOMYCETES

- Ustilago violacea* (Pers.) Wint., on *Lychnis alba*. W. *Puccinia menthae* Pers., II, on *M. aquatica*. W.  
*Melampsorella cerastii* (Pers.) Schroet., II, on *C. arvense*. W. \**P. conii* Fuckel, II, on *Conium*. W.  
*Coleosporium senecionis* (Pers.) Fr., II, on *S. vulgaris*. S. *P. pulverulenta* Grev., OI, on *Epilobium hirsutum*. S.  
†*Uromyces limonii* Lév., OI, on *Statice*. W. *P. malvacearum* Mont., III, on *M. sylvestris*. S.  
*U. dactylidis* Otth, III (old), on *Dactylis*. W. *Puccinia graminis* Pers., III (old), on *Agropyron*. S.  
†*Puccinia tripolii* Wallr., III, on *Aster Tripolium*. W. *P. glumarum* Er. and Henn., II, III, on *Agropyron*. S.  
\**P. carduorum* Jacky., II, III, on *C. nutans*. W. \**P. bromina* Erikss., II, on *B. mollis*. S.  
*P. obtegens* Tul., O, II, on *C. arvense*. S., W. \**P. anoloma* (=simplex Er. and Henn.), on *Hordeum*. W.  
\**P. tragopogi* (Pers.) Corda, OI, on *Tragopogon*. S. *P. magnusiana* Koern., III (old), on *Phragmites*. W.  
*P. taraxaci* Plowr., II, on *Taraxacum*. S., W. *P. phragmitis* (Schum.) Koern., OI, on *Rumex*. S.  
*P. sonchi* Rob., II, on *S. oleraceus*. S. *P. poarum* Niels., OI, on *Tussilago*. W.  
*P. punctata* Link, OI, on *Galium verum*. S. \**P. arrhenatheri* Erikss., II, on *A. elatior*. S.

An aecidial stage on *Ranunculus repens* may belong either to *U. dactylidis* near which it was found, or to *P. magnusiana*, which was only a few yards away.

†*Uredo ammophilina* on *A. arenaria*. S.

Dr. Wilson, of Edinburgh, informed me some years ago that this rust is not uncommon at Spurn and in 1936 he found teleutospores which may belong to this.

- \**Lentinus lepideus* Fr. Frequent on the railway sleepers of the line to Spurn Point.  
*Pholiota praecox* (Pers.) Fr. S.  
*Tubaria furfuracea* (Pers.) W. G. Sm. S.  
*Stropharia semiglobata*. (Batsch) Fr. S. W.

## FUNGI IMPERFECTI

- |  |   |
|--|---|
| * <i>Septoria apii</i> Chester., on <i>Apium</i> . S.                              | <i>Botrytis cinerea</i> Pers. S., W.            |
| † <i>Leptothyrium asternum</i> B. and Br., on<br><i>Aster Tripolium</i> . W.       | <i>Torula herbarum</i> Link S., W.              |
| † <i>Papularia sphaerospora</i> (Pers. ex Fr.)<br>v. Hohn., on <i>Phragmites</i> . | <i>Cladosporium herbarum</i> (Pers.) Link<br>W. |

**Ornithology** (Mr. Ralph Chislett) : The principal value to Yorkshire ornithologists of a visit to Spurn, Kiltse Warren, and the Humberside marshes of Welwick, between June 7th and 11th, lay in the opportunity to assess the breeding birds and so help towards their separation from passage migrants of late summer. Starling, Linnet, Reed Bunting, House Sparrow, Meadow Pipit, Whitethroat and Blackbird were abundant ; the huts of the War Department provided haunts for Starlings and Sparrows, and the other species nesting in the low herbage, mainly marram grass and buckthorn, Greenfinches, Corn Buntings, Song Thrushes and Hedge Sparrows were less numerous. Carrion Crow and Magpie, Chaffinch, Pied Wagtail, Sedge Warbler and Wren were few. Only one pair of Yellow Wagtails (feeding young near Welwick) was noted. A small colony of several pairs of Reed Warblers, near Skeffling, had not been previously recorded.

A Swallow, sitting on four eggs, shared its O.P. habitat with several naturalists during heavy rain. Martins and Swifts were noted. A female Cuckoo passed the week-end, attended by two males, in the vicinity of the ringing trap, in which a Cuckoo had been caught and ringed a week previously. Kestrel, Sparrowhawk, Heron and Turtle Dove were seen occasionally. Ducks on the estuary were several pairs of Shelducks (breeding locally), a pair of Tufted Ducks, and a distant flock of black ducks, probably common Scoters.

Breeding waders included a few Lapwings, whose numbers should have been greater ; Ringed Plovers (four nests seen) ; three pairs of Oystercatchers, one of which, at least, had an egg ; and Redshanks, vociferous over their young, in several places.

Many nests of the Little Tern were seen, some with only one egg and very few with three. One pair had young. This is the only such colony in Yorkshire and it has stood up to war conditions remarkably well ; much better than it is likely to do to the disturbances caused by parties that now picnic near to the nesting ground on fine Sundays. If the new road to the Point remains open the Terns will probably have disappeared in a very few years, since they cannot maintain themselves unless they rear sufficient chicks to repair natural wastage, which they are not likely to do this year.

Other local breeders noted were Moorhen, and Common and Red-legged Partridge (nest found). The Wheatear, a former regular breeder, was not noted.

At this date passage migrant species were few and in small numbers, but some of the waders seen would certainly not breed locally. At high tide, up to 100 Curlews lined the shore and upwards of 40 Oystercatchers. Dunlins, Golden and Grey Plovers and Sanderlings were fewer, but were noted. A few Sandwich and Common or Arctic Terns passed. The motley gulls included all six species in most stages of plumage. A Kittiwake picked up dead (very recent) was in excellent feather.

Later, at Spurn, specific possibilities will have no limit. Even on June 10th, when Swifts should be nesting, parties flew both ways along the promontory. Whether they were passage birds, or merely on foraging expeditions could not be stated. During incubation Swifts are little in evidence about their habitat for long periods, and their mileage is not coupon-governed. A few House Martins were also noted flying South.

MAMMALS noted include Hare, Rabbit and Brown Rat, and Otter footprints were noted in the mud of several dykes. A member of the party caught a Weasel.

**Conchology** (Mrs. E. M. Morehouse) : Conditions for observing the land molluscs on Spurn Point and on the banks of Welwick Marsh were good, but the number of species were few although *H. aspersa* Müller, and *H. nemoralis* L., occurred in vast quantities. Here, the most noticeable feature, especially among the *H. nemoralis* L., was the immaturity of the specimens. The species noted were :

## SPURN.

*H. aspersa* Müller, and vars.  
*H. nemoralis* L., and vars.

*Helicella virgata* Da Costa.  
*Arion ater* L.

## WELWICK MARSH.

*H. aspersa* Müller.  
*H. nemoralis* L., and vars.  
*Helicella virgata* Da Costa.  
*Cochlicopa lubrica* Fée.  
*Vitrea nitidula* Drap.

*Theba cantiana* Montagu.  
*Vitrea cellaria* Müller.  
*V. alliaria* Miller.  
*Arion ater* L.

## IN POND IN QUARRY, WELWICK MARSH.

*Limnaea stagnalis* L.

*L. pereger* Müller.

In the estuary of the Humber, a cockle (*Cardium edule* L.) bed was observed. The number of valves on the shore led to a look-out for the bed. The following molluscs were also seen :

*Macoma balthica* L.  
*Buccinum undatum* L.

*Littorina saxatilis* Olive.

**Entomology** (W. D. Hincks) : The weather proved unfavourable on both the occasions on which Spurn was visited and consequently the list of species taken there is meagre, although a few of the expected sand-dune insects were found, principally at the roots of Marram Grass. On the day the Welwick salt marshes were visited (June 9th), conditions were excellent and some interesting species were noted.

S=Spurn, 8th and 10th ; W=Welwick, 9th ; E=Easington, 11th.

**DERMAPTERA and ORTHOPTERA.**—Immature earwigs (*Forficula auricularia* L.) were fairly numerous on Spurn, most of them were in the second and third instars. A few first instar examples were observed and also adult females. Several colonies of hoppers (immature grasshoppers) were noted on Spurn, all of which were very young. The species represented appeared to be *Chorthippus* spp. and *Myrmeleotettix maculatus* (Th.). On the Humber shore at Welwick, hoppers were found to be much further advanced and even a few adults of both sexes of *Chorthippus albomarginatus* (Deg.) were taken. *M. maculatus* appeared to be absent here.

**COLEOPTERA.**—The most interesting capture was †*Phaedon regnium* Tottenham, described in 1941 (*Ent. mon. Mag.*, 77 : 14), from Bosham, West Sussex, and near Leigh-on-Sea, South Essex, and subsequently recorded (*Ent. mon. Mag.*, 77 : 62) from the Isle of Sheppey. The species has not been recorded elsewhere than in the south-east corner of England, so that its occurrence in some numbers at Welwick is of considerable interest. Specimens were obtained by sweeping mixed herbage in which were growing plants of Scuvy Grass, *Cochlearia anglica* L., the food-plant of the beetle.

*Dyschirius salinus* Schm. W.  
*Broscus cephalotes* (L.). S.  
*Bembidion normannum* Dj. W.  
*B. varium* (Ol.) W.  
*Trechus obtusus* Er. E.  
*Pogonus chalceus* (Msh.) W.S.  
*Dicheirotichus gustavii* Crotch. S.  
*Amara familiaris* (Df.) W.  
*A. convexiuscula* (Msh.) E.  
*Calathus mollis* (Msh.) S.  
*Risophilus monostigma* (Sam.) S.  
*R. atricapillus* (L.) S.E.  
*Dromius melanocephalus* Dj. S.  
*D. notatus* Steph. S.  
*D. linearis* (Ol.) S.  
*Trogophloeus halophilus* Ks. W.

*Stenus flavipes* Steph. S.  
*Xantholinus angustatus* Steph. S.  
*X. tricolor* (F.) S.  
*Philonthus fimetarius* (Gr.) W.  
*Staphylinus ater* Gr. W.  
*Cantharis lateralis* L. S.  
*Malthodes pumilus* (Breb.) W.  
*Heterocerus flexuosus* Steph. W.  
*H. sericans* Ks. W.  
*Ephistemus globulus* (Pk.) W.  
*Phalacrus coruscus* (Pz.) W.  
*Corticaria crenulata* (Gyll.) E.  
*Subcoccinella 24-punctata* (L.) W.  
*Rhyzobius litura* (F.) S.  
*Coccidula rufa* (Hbst.) S.  
*Nacerdes melanura* (L.) S.

## COLEOPTERA—continued

- |  |  |
|--|--|
| <i>Pyrochroa serraticornis</i> (Scop.). W. | <i>A. ervi</i> Kby. S.                         |
| <i>Notoxus monoceros</i> (L.). S.          | <i>Otiorrhynchus ovatus</i> (L.). S.           |
| <i>Aegialia arenaria</i> (F.). S.          | <i>Cneorrhynchus plumbeus</i> (Msh.). E.       |
| <i>Aphthona euphorbiae</i> (Schr.). S.W.   | <i>Philopodon plagiatus</i> (Schl.) S.         |
| <i>Longitarsus suturellus</i> (Df.). S.W.  | <i>Cleonus piger</i> (Scop.). S. (Dr. Crosbie) |
| <i>Mantura rustica</i> (L.). S.            | <i>Miccotrogus picirostris</i> (F.). S.        |
| <i>Cassida rubiginosa</i> Mil. S.          | <i>Magdalis ruficornis</i> (L.) W.             |
| <i>Apion miniatum</i> Grm. S.              | <i>Mecinus pyraister</i> (Hbst.). S.           |
| <i>A. carduorum</i> Kby. S.                | <i>Rhynchaenus alni</i> (L.). W.               |

## HYMENOPTERA

- |                                       |   |
|---------------------------------------|---|
| <i>Cephus pygmaeus</i> (L.). W.       | <i>Cratichneumon culex</i> (Mil.). W.             |
| <i>Arge cyaneocrocea</i> (Fst.). W.   | <i>C. fabricator</i> (F.). W.                     |
| <i>A. ustulata</i> (L.). W.           | <i>Allomya debellator</i> (F.). W.                |
| <i>Tenthredopsis nassata</i> (L.). W. | <i>Cryptus laborator</i> (Thunb.). W.             |
| <i>Macrophya rapae</i> (L.). W.       | <i>Pycnocryptus director</i> (Thunb.). W.         |
| <i>Dolerus pictipes</i> (Kl.). W.     | <i>Lampronota piceator</i> (Thunb.). E.           |
| <i>D. aeneus</i> Htg. W.              | <i>Collyria calcitrator</i> (Gr.). W.             |
| <i>D. nigratus</i> (Mil.). W.         | <i>Tryphon signator</i> Gr. W.                    |
| <i>Hoplocampa crataegi</i> (Kl.). E.  | <i>Diplazon laetatorius</i> (F.). S.              |
| <i>Bracon terebella</i> Wsm. W.E.     | † <i>Lymaea litoralis</i> (Hal.). W.              |
| <i>B. epitriptus</i> Msh. W.          | <i>Pompilus plumbeus</i> (F.). W. (Mr. Cheetham). |
| <i>Euphorus pallipes</i> (Curt.). S.  | <i>Coelioxys rufescens</i> Lep. and Serv. S.      |
| <i>Trioxys heraclei</i> (Hal.). W.    | (Mr. Cheetham).                                   |
| <i>Aphidius sonchi</i> Msh. S.W.      |   |

HEMIPTERA : *Gampsocoris punctipes* (Grm.). S.

DIPTERA : *Tropidia scita* (Harr.) W.

**Diptera and Arachnida** (C. A. Cheetham) : The rain on Saturday and Monday spoilt the dipterists' hopes for collecting on Spurn, but the fine day on Welwick Marsh and amongst the adjoining gravel-pits and ponds and also along the coast on the return to Easington provided some recompense.

A small brackish pool alongside the marsh embankment provided an addition to the Yorkshire list of diptera, *Rhamphomyia spissirostris* Fln. This was amongst the sedges on the margin whilst *Hydrophorus litoreus* Fln., which has only been recorded in Yorkshire previously from Helwith Moss, skimmed the water surface in a troublesome manner. Another addition to our list *Chamaemyia (Ochthiphila) juncorum* Fal., was swept from vegetation around the gravel-pit ponds. The two very common species of *Tipula*, *T. paudosa* Mg., and *T. vernalis* Mg., do not appear to have been put on record for V.C. 61.

Three species of *Thereva* were taken *T. nobilitata* Fab., *T. plebeia* L., and the sand loving *T. annulata* Fab., also the fly generally seen on decaying seaweed, *Fucellia maritima* Hal., and one specimen of *Lucina fasciata* Mg. I had taken this at Spurn on a previous occasion. *Ditaenea (Sciomyza) cinerella* Fln., and *Geomyza obscurella* Fln., complete the noteworthy species of flies.

Four species of spiders which were collected included *Tetrax denticulata* Oliv., which Falconer does not give for the vice-county, with *Tibellus parallelus* K. (very plentiful), *Tetragnatha extensa* L., and *Aranea foliata* Four.

**Lepidoptera** (Miss J. Sykes) : The following species which have been checked by Mr. Arthur Smith were observed :

BUTTERFLIES (12 species).

- |   |  |
|---|--|
| Wall <i>Pararge megera</i> L.               | } Common in lane from Welwick to salt marsh. |
| Large White <i>Pieris brassicae</i> L.      |  |
| Small White <i>P. rapae</i> L.              |  |
| Green Veined White <i>P. napi</i> L.        |  |
| Orange Tip <i>Anthocharis cardamines</i> L. |  |
| Small Heath <i>Coenonympha pamphilus</i> L. | } Lane and gravel-pit, Welwick.              |
| Common Blue <i>Polyommatus icarus</i> Rott. |  |
| Small Copper <i>Lycaena phlaeas</i> L.      |  |

Common in gravel-pit, and at Spurn.



## BUTTERFLIES—continued

Large Skipper <i>Ochlodes venata</i> Bremer	} Welwick.
and Grey.	
Peacock <i>Nymphalis io</i> L.	
Painted Lady <i>Vanessa cardui</i> L.	
Meadow Brown <i>Maniola jurtina</i> L.	

## MOTHS (8 species) :

Silver Y <i>Plusia gamma</i> L.	Very common and mainly in bad condition. Some seen to come from the sea to the land, so probably migrants.
Silver Ground Carpet <i>Larentia montanata</i> L.	
Common Carpet <i>L. sociata</i> Bork.	
Purple Bar Carpet <i>L. ocellata</i> L.	
Common Shark <i>Cucullia umbratica</i> L.	By Y.N.U. cottage at Spurn.
Cinnabar <i>Hipocrita jacobaeae</i> L.	Kilnsea Warren.
Mother Shipton <i>Euclidia mi</i> L.	Welwick pit railway line.
Large White Plume <i>Acipitilia pentadactyla</i> .	Kilnsea Warren.

There was an abundance of Burnet Moth pupæ on the Spurn peninsula.

Caterpillars of the Drinker Moth, some species of Tiger Moth and the Goldtail Moth were fairly common.

## AINDERBY STEEPLE, June 22nd

On Saturday, June 22nd, the Union met to investigate Ainderby Bottoms and Poole's Waste. The area comes into the North-west Vice-county (65) by reason of its position to the West of the River Wiske which is the dividing line at this point between the North-east (V.C. 62) and North-west (V.C. 65).

It is low-lying land, about 100 ft. O.D., and is more nearly a part of the Vale of York than of the hilly country of the dales. It seems to be a possible locality for some of the 'now gone' species from Halnaby Carr eight miles to the north and other similar lowland carrs. We were glad to meet associates from the Darlington and Teesdale Naturalists' Field Clubs, and at the meeting after tea eight societies responded to the roll call, some thirty members having been on the excursion.

The thanks of the members present were given to the landowners for their permission to visit the area and to our Divisional Secretary, Mr. J. P. Utley, who had made all the arrangements for the meeting.

**Flowering Plants** (W. A. Sledge) : Ainderby Bottoms or Carr, consists of a considerable swampy area of sedges and reeds with some birch-willow-alder carr wood, separated by dikes from low-lying marshy fields the vegetation of which is subject to grazing by cattle. The central fenced-off and ungrazed swampy area is ecologically the most interesting region and the existence of communities similar to those on developing peat mosses of the North-west is particularly interesting in view of the statement that the present conditions date back to little more than 40 years ago. Here, in one area amongst scattered Birch and Willow (*S. atrocinerea*) bushes and tussocks of *Molinia* with some *Sphagnum* spp., the typical plants were *Genista anglica*, *Potentilla palustris*, *Calluna vulgaris*, *Salix repens*, *Luzula multiflora* var. *congesta*, *Agrostis canina*, *Phragmites communis*, *Festuca capillata* and *Equisetum palustre*. Elsewhere *Eriophorum angustifolium* and the taller-growing sedges and rushes (*J. effusus*) with *Phragmites* and *Iris* were the principal species present while over much of the area *Potentilla palustris* grew in great profusion.

The marshy and rushy (*J. effusus* and *J. inflexus*) fields yielded a considerable number of species characteristic of such a habitat. Here perhaps the most strikingly plentiful of the less common species was *Stellaria glauca*, both the glaucous and green-leaved forms of which occurred. In another region *Carex disticha* was dominant over a considerable area and in parts was the only species present.

The dikes separating the marshy fields from one another and these from the reed and carr-wood swamp, produced some of the most interesting species seen in the course of the excursion. These included *Ranunculus Lingua*, *Apium inundatum*, *Hydrocharis Morsus-ranae*, and *Catabrosa aquatica*. *Hottonia palustris*

made a fine show and *Menyanthes trifoliata* was in good flower. Other species noted included :

*Ranunculus sceleratus* L.  
*Nasturtium palustre* DC.  
*Oenanthe fistulosa* L.  
*Valeriana dioica* L.  
*Veronica Anagallis-aquatica* L.  
*V. scutellata* L.  
*Pedicularis palustris* L.  
*Orchis latifolia* L. sec Pugsf.  
*Triglochin palustre* L.

*Carex rostrata* Stokes.  
*C. hirta* L.  
*C. fulva* Host.  
*C. flacca* Schreb.  
*C. panicea* L.  
*C. elata* All.  
*C. nigra* (L.) Reichard-  
*C. echinata* Murr.  
*C. disticha* Huds.

After lunch another and similar area of low-lying marshy and swampy fields on the other side of the village was investigated. Many of the species previously listed were seen again with the addition of *Potamogeton crispus*, *P. densus*, *Carex riparia*, *C. gracilis*, *C. leporina*, and *C. otrubae*.

None of the botanists present visited Poole's Waste but it may be stated that the Balsam referred to in the circular as abundant there is *Impatiens glandulifera* and not *I. Noli-tangere* as stated. Specimens of *Hesperis matronalis* were brought back from there.

**Mosses** (C. A. Cheetham) : On a marshy place like Ainderby Bottoms one expects to find harpidioid mosses, but none were found. The most widespread moss was *Hypnum cuspidatum* L., with a fair amount of *H. cordifolium* Hedw., in the wetter places and some fine *H. giganteum* Schp., in two or three spots. *Brachythecium salebrosum* B. and S., on fallen trunks was a good find. On these and on old tree stumps were *Dicranoweisia cirrata* Lindb., *Aulacomnium androgynum* Schwaeg., *Plagiothecium denticulatum* B. and S., *Amblystegium serpens* B. and S., and *Eurhynchium praelongum* Hobk. On the ground there was plenty of *Mnium Offine* Bland., and some *M. hornum* L., *M. punctatum* L., *Webera nutans* Hedw., *Dicranella heteromalla* Schp., *Amblystegium Kochii* B. and S., and *Dicranum scoparium* Hedw. In the wetter parts were *Aulacomnium palustre* Schwaeg., *Polytrichum strictum* Banks and a little *Amblystegium filicinum* De Not.

Mr. A. Thompson has kindly identified the following species of *Sphagnum* which I sent to him :

*Sphagnum fimbriatum* Wils., var. *intermedium* Russ.  
*S. plumulosum* Roll., and *S. cymbifolium* Ehrh.

**Fungi** (W. G. Bramley) : A short visit was paid the day following the official excursion and although time and weather only allowed about an hour's examination of The Bottoms several interesting species were found. The most interesting was a white Tremella-like fungus which, when the log on which it was growing was turned over, 'puffed' a cloud of spores. Examination showed it to be an ascomycete and Dr. Dennis has named it *Neobulgaria pura*. It is probably the first British record.

*Tapesia retincola*, new to Yorkshire, was also found. Growing at the base of old *Phragmites* it is probably no uncommon as I have seen it at Scarthingwell Park and Askham Bog this year.

*Leptosphaeria culmorum*, found at the top of culms of *Deschampsia caespitosa*, is also new to Yorkshire, and has also been found over a wide area recently. This is not listed in Bisby and Mason's *List of Pyrenomyces recorded for Britain*.

\* New to V.C. 65. † Not in *Catalogue of Yorkshire Fungi*.

## MYXOMYCETES

*Lycogala epidendrum* Fr.

## ASCOMYCETES

† *Neobulgaria pura* (Fr.) Petrak  
*Mollisia atro-cinerea* (Cooke) Phill.

† *Tapesia retincola* (Rab.) Karst.

\* *Colpoma quercina* (Pers.) Wallr., on  
*Quercus*.

† *Leptosphaeria culmorum* Auersw.

† *L. deraea* (B. and Br.) Auersw., on  
 stems of *Senecio aquatica*.

*Ophiobolus acuminatus* (Sow.) Duby,  
 on thistle stems.

## ASCOMYCETES—continued

- †*Cryptodiaportha hrancensis* (Petr.) Wehm., on *Tilia*.  
 \**Cryptospora suffusa* (Fr.) Tul., on *Alnus*.  
 †*Diplotella ditopa* (Fr.) Schroet., on *Alnus*.  
*Diatrype stigma* (Hoffm.) Fr.

## BASIDIOMYCETES

- \**Puccinia acetosae* (Schum.) Koern., II, on *R. acetosa*.  
*P. magnusiana* Koern., OI, on *Ran. repens*, III, on *Phragmites*.  
*Marasmius oreades* (Bolt.) Fr.  
*Stropharia semiglobata* (Batsch) Fr.  
*Polyporus squamosus* (Huds.) Fr.

## FUNGI IMPERFECTI

- †*Septoria gramineum* var. *molinae* Trail., at base of stems of *Molinia*.  
*Cladosporium herbarum* (Pers.) Link

**Ornithology** (R. Chislett) : Low-lying land into which surrounding undulations drain, and from which the water has for many years been unable to get away, has recently had such drains as there are deepened. Consequently, the rough ground—rush, reed, heather, etc., with willow and birch bushes—could be explored at the cost of wet feet, and showed the birds expected. Reed-Buntings (nests seen), were numerous, with Linnets, Sedge-Warblers, Whitethroats and Willow Warblers. Whinchats called from the wires. Mallard and Moorhen, Redshank, Lapwing, Snipe and Skylark had young. By the Ainderby village green, Goldfinch, Greenfinch, Chaffinch and Spotted Flycatcher were noticed. Other species seen were : Carrion Crow, Rook, Jackdaw, Magpie, Starling, (already flocking), Yellowhammer, Tree-Pipit, Pied Wagtail, Great, Blue, and Marsh Tits, Mistle and Song Thrushes, Blackbird, Robin, Hedge-Sparrow, Wren, Swallow, Sand-Martin, Swift, Great Spotted Woodpecker, Cuckoo, Wood Pigeon, Stockdove, Curlew, Black-headed Gull (a small colony was there for some years to 1945), Pheasant and Common Partridge.

After lunch we visited Poole's Waste, a former circular bend of the Swale now by-passed by the river, but still containing water and flooded during spates. Mallard and Moorhen bred here too and many of the species mentioned above were noted. Long-tailed Tits were seen. By the Swale a cock Yellow-Wagtail displayed anxiety. About 100 pairs of Sand-Martins flitted about their holes. Several Herons were seen. Two Oystercatchers came from a bed of shingle and flew over a riverside field to alight in the nest where they walked about feeding. Water-Rails, if present, made no sign ; beds of reed-mace were unapproachable.

**Diptera** (C. A. Cheetham) : The diptera of Ainderby Bottoms must be headed with the 'vicious gnat' of the circular ; unfortunately, or fortunately, little was seen or felt of this insect's attentions. Two species of mosquitoes were caught and the honour must go to *Aedes (Ochlerotatus) annulipes* Mg., two females of which were taken in the act of biting. In the British Museum book on British Blood-sucking flies, it is said to be 'very abundant and troublesome in some fens and carrs.' The other species, of which two males were caught flying, was *Theobaldia (Culicella) fumipennis* Steph. The place will certainly produce other species at different seasons and I should certainly expect to find *Anopheles claviger* Mg. (*bifurcatus* L.) here and possibly *Aedes (Ochlerotatus) punctor* Kirby (*nemorosus* Mg.). All these are efficient biters on Austwick Moss. On a marshy place like the Bottoms the crane-fly with grey body and brush of tawny hairs at the tip, *Tipula luna* Westf. (*lunata* L. in Wingate) was to be expected. A similar grey species with sawlike antennae *Prionocera turcica* Fab. (*T. diana* Mg. in Wingate) had only been reported for the vice-county previously from Bedale. Amongst the smaller crane-flies *Rhamphidia (Helius) longirostris* Mg., might have been expected though it has not been recorded from this vice-county previously. Other species taken and to be expected in such places are *Ptychoptera scutellaris* Mg., *Limnophila ferruginea* Mg., *Erioptera fuscipennis* Mg., *E. squalida* Lw., and in the fields around *Tipula oleracea* L., *T. vernalis* Mg., *T. unca* Weid. (*longicornis* Schum.), *Pachyrhina maculata* Mg., and *Dicranomyia modesta* Mg. Amongst the reed-beds the reed borers *Tetanocera elata* F., *T. coryleti* Scop., and *T. laevifrons* Lw., were caught



with *Chrysopilus cristatus* Verr., *Dolichopus wahlbergi* Zett., and *D. unguatus* L., on the water edge.

**Lepidoptera** (Miss J. Sykes) : Considering the favourable weather it was a disappointing day, only six Butterflies and five Moths being observed.

#### BUTTERFLIES.

Large White <i>Pieris brassicae</i> L.	Common.
Small White <i>P. rapae</i> L.	Common.
Orange Tip <i>Anthocharis cardamines</i> L.	
Small Heath <i>Coenonympha pamphilus</i> L.	Common.
Small Copper <i>Lycaena phlaeas</i> L.	
Large Skipper <i>Ochlodes venata</i> Bremer and Grey.	

#### MOTHS.

Chimney Sweeper <i>Odezia atrata</i> L.	Common on railway embankment.
Latticed Heath <i>Fidonia clathrata</i> L.	Three taken on railway embankment and marsh. Is this a new inland record for Yorkshire?
One Green Forester <i>Adscita statites</i> L.	On marsh.
Common Wave <i>Cabera exanthemata</i> Scopoli.	Abundant in swampy wood.
Silver Y <i>Plusia gamma</i> L.	

### ILKLEY, July 6th.

Judged by the number of people present the Ilkley meeting must stand high, though the actual results in the various activities of the sections will not be considered quite so satisfactory.

Memories of a similar large gathering of members and associates at Bingley in 1922 were revived by the few who were present at both. A large party on preserved ground needs supervision and is a source of considerable trouble to those responsible for the excursion. At the meeting which followed the tea, where over 60 sat down, our grateful thanks were given to Mr. W. F. Fearnley, who made the arrangements, and to Dr. K. C. Crosbie, who carried on during Mr. Fearnley's short absence, and also to those who so kindly gave the necessary permissions.

The questions raised in your Secretary's mind by the large number of people present may have to be considered at future meetings. Perhaps a return to the old plan of official leaders for the various sections, and these working in separate groups may help. More investigational work would result. It might be necessary for a large section such as the Vertebrate to split up into several small groups working in different directions.

To most members the amount of Leopard's Bane, *Doronicum Pardalianches* L., in Denton Woods was strange, but as Dr. Sledge pointed out to me it was seen when the Union met at Ilkley on May 25th, 1878, and it is mentioned in the report on that meeting in Vol. I of our Botanical Transactions, and in the same issue Dr. Parsons records it in his list as a denizen at Denton.

**Flowering Plants** (G. A. Shaw) : It was not to be expected that anything new would be discovered in such a well-worked district as Ilkley, and this turned out to be the case.

*Epipactis latifolia*, long known in the grounds of Wells House, was seen at the start of the excursion. Not all the moorland plants listed in the circular were seen, partly owing to lack of time for searching, though all are known to occur. *Vaccinium Oxycoccus* was seen in several bogs, and *V. Vitis-Idaea* also occurs. Two plants recorded between thirty and forty years ago by Mr. Albert Wilson should be looked for again. These are *Trientalis europaea* and *Listera cordata*, both in the vicinity of the Cow and Calf Rocks. Perhaps this is a suitable place to mention that I recently found *L. cordata* in a new locality on the lower slopes of Beamsley Beacon, a few miles further up Wharfedale.

Nothing outstanding was seen on the riverside, though another old record made by Mr. Wilson is for *Carex pendula* on the banks of the Wharfe near Ilkley, and this, too, should be looked for.



The woods about Hundwith Beck provided a more varied flora and the following were seen : *Doronicum Pardalianches* L., in abundance and looking quite at home, *Stellaria nemorum* (L.) Vill., *Scrophularia aquatica* L., *Orchis Fuchsii* Druce, *Carex acutiformis* Ehrh., *C. sylvatica* Huds., *C. remota* L., *Equisetum Telmateia* Ehrh. Mr. A. Thompson later informed me that *Ranunculus sceleratus* L., and *Nasturtium palustre* DC., were seen by Denton Park lake.

**Bryophyta** (A. Thompson) : On stones by the stream outside Denton Park Wood were *Barbula unguiculata* Hedw., *Bryum capillare* L., *Brachythecium plumosum* B. and S., *Amblystegium filicinum* de Not., and *Hypnum falcatum* Brid. Inside the wood near the stream occurred *Dichodontium pellucidum* Schp., *Mnium punctatum* L., *Hypnum palustre* Huds. and the liverworts *Eucalyx obovatus* (Nees) Breidl., and *Chiloscyphus polyanthus* (L.) Corda. The ground in the wood showed patches of *Mnium hornum* L., and of *Plagiothecium elegans* Sull. *Barbula fallax* Hedw., was also found there.,

*Orthodontium gracile* Schwaeg., var. *heterocarpa* Wats., *Amblystegium serpens* B. and S., and the hepatic *Lophocolea heterophylla* (Schrad.) Dum., were gathered from an old tree-stump.

**Ornithology** (Mr. Ralph Chislett) : This meeting attracted possibly the largest attendance of recent years, with a good half of those present displaying an interest in birds. Although the date was late for observation of breeding biology, the day was fine if windy, and at the end of it one felt that we had not used our time, opportunities and human material for quite the ecological best. There was too much haphazard pilgrimage, with youth keeping ahead ; and after halting to investigate anything, one was apt to find the ground ahead had been surged over and birds driven away before many could see them. With so many experienced ornithologists available, and with so many anxious to learn about some of the simpler facts, it might have been profitable to have divided into several parties, each in charge of a competent man, with a particular area assigned for the day, and with a rendezvous for late afternoon for collation of experiences. I would myself have felt the whole day to have been well spent with a small party on some part of either of the two main areas (Ilkley Moor and Denton Park), neither of which was adequately covered. The suggestion is put forward for consideration and possible use at future meetings that are anything like so well attended.

Every Yorkshireman wants to cross Ilkley Moor once. Species seen there were Red Grouse (with well-grown young), Redstart, Ring-Ousel, Whinchat, Curlew, Kestrel, Golden Plover, Skylark, Meadow Pipit, Black-headed and Lesser Black-backed Gull. Breeders that did not show themselves included the Dunlin (known to have bred this year), Merlin and Nightjar. Under trees on the lower ground, Spotted Flycatcher, Moorhen, Great and Blue Tits were noticed. A Lesser Redpoll was picked up dead by Dr. Crosbie.

The riverside pastures below Denton Park showed Lapwings in flock to the number of about 100 birds, two or three pairs of Redshanks (young seen), Snipe, Yellow Wagtail, Pied Wagtail, Reed-Bunting (a nest held two young and an egg), Kingfisher and Common Sandpiper.

The woods above were remarkably silent as I passed through. Not a warbler sang, and only the Common Wren sang loudly. Young and old Jays were calling. Under some wild cherry trees, stones, neatly halved with the kernels extracted, were probably the work of Hawfinches. The Tree-creeper was seen and the Goldcrest heard.

Other species noted were Carrion Crow, Rook, Magpie, Starling, Greenfinch, Goldfinch, Chaffinch, House Sparrow, Yellow-hammer, Tree-Pipit, Marsh Tit, Mistle Thrush, Song Thrush, Blackbird, Robin, Swallow, Martin, Sand Martin, Swift, young Cuckoo attended by pipits, Heron, Wood Pigeon, Pheasant, making 51 in all, without a single warbler, although when I called in a wood on the way home to Masham a Blackcap sang very sweetly. A month earlier, with more birds singing, the list would probably have been extended by at least 20 per cent.

**Conchology** (Mrs. E. M. Morehouse) : Two of us proceeded to the habitat of *Azeca tridens* Pulteney. We searched minutely but the place where this mollusc was formerly found was much altered by the growth of conifers and it was very dry under them ; however, the edge of the wood higher up yielded a fair number of

molluscs. Coming back by the Ilkley-Addingham road, I examined the lower edge of the wood and found an immature specimen of *A. tridens* Pulteney, but the beautiful var. *crystallina* Dupuy., seems to have disappeared.

The following were observed :

<i>Vitrea pura</i> Alder.	<i>Clausilia bidentata</i> Ström.
<i>V. alliaria</i> Miller.	<i>C. laminata</i> Montagu.
<i>V. rogersi</i> B. B. Woodward.	<i>Carychium minimum</i> Müller.
<i>V. cellaria</i> Müller.	<i>Hygromia granulata</i> Alder.
<i>V. nitidula</i> Drap.	<i>H. rufescens</i> Pen.
<i>Pyramidula rotundata</i> Müller.	<i>Azeca tridens</i> Pulteney.
<i>P. rotundata</i> v. <i>alba</i> Moq. Tan.	<i>Agriolimax agrestis</i> L.
<i>Euconulus fulvus</i> Müller	<i>Arion ater</i> L.
<i>Ena obscura</i> Drap.	<i>A. ater</i> v. <i>brunnea</i> Roebuck.
	<i>Limax maximus</i> L.

Mr. J. H. Lumb took from the River Wharfe :

<i>Sphaerium corneum</i> L.	<i>Ancylus fluviatilis</i> Müller.
<i>Planorbis albus</i> Müller.	

and on the banks saw *Agriolimax agrestis* L.

Mr. and Mrs. Thurgood took the road to Ben Rhydding and found

<i>Vitrea crystallina</i> Müller.	<i>Helix hortensis</i> Miller.
<i>Hygromia hispida</i> L.	<i>Cochlicopa lubrica</i> Miller.
<i>H. rufescens</i> Pen.	<i>Ancylus fluviatilis</i> Müller.

**Entomology** (W. D. Hincks) : I joined the party in the afternoon and collected for a short time near the river. Wind rendered collecting very unsatisfactory even in the sunshine, and little of interest was taken.

Mayflies were abundant, including *Ephemerella ignita* (Poda), *Baetis bioculatus* (L.), *B. scambus* Eat., *Centroptilum pennulatum* Eat., and *Procladius rufulum* (Mil.). The only Coleoptera worthy of mention were *Donacia simplex* F., and *Byturus tomentosus* (Deg.). The few Hymenoptera included *Rogas unipunctator* (Thunb.) (= *irregularis* Wesm.), *Mellinus arvensis* (L.) and *Aphelinus abdominalis* (Dalm.). The last species is new to Yorkshire from Seckar Wood, V.C. 63, 3/7/43, and occurred at Hebden Bridge, V.C. 63, 20/7/45. It is also new to V.C. 64, from Brayton, Selby, 23/6/44. The best Diptera were *Nemotelus nigrinus* Fall., *Zelima lenta* (Mg.), and *Tephritis bardanae* (Sch.).

**Diptera** (C. A. Cheetham) : There was too little time to make a good collection of the two-winged flies. One small cranefly with very prettily-marked wings, *Limnophila* (*Ephelia*) *submarmorata* Verr., has only been taken in the county once previously, and another with plain wings, *L. sepium* Verr., has only been recorded previously in the Bradford Naturalists' list from Middleton. The small clear yellow *Cheilotrichia* (*Empeda*) *flava* Schum., was plentiful, also the delicate-marked winged *Rhipidia maculata* Mg. Amongst the large species were *Tipula fulvipennis* Deg., *T. scripta* Mg., *Pachyrrhina quadrifaria* Mg., and *Ptychoptera lacustris* Mg. The strange black species with very long white tarsi, *Dolichopeza albipes* Strom., flew in the dark places on the stream banks where only its extended white tarsi could be seen. Among the Dolichopods there was an addition to the Yorkshire list, *Porphyrops riparia* Mg., and others in this group were *Psilopus platypterus* F., *Xiphandrium appendiculatum* Zett., and *Dolichopus pennatus* Mg. Two reed-borers caught were *Tetanocera elata* F., and *T. laevifrons* Lw. No doubt more of these would have been caught if time had permitted the reeds around the lake to be swept. The curious small hover fly, *Sphegina clunipes* Fln., and the black *Beris chalybeata* Forst., complete the list.

### ROBIN HOOD'S BAY, July 20th.

We were fortunate in having a fine day for this excursion though it was rather too windy for the entomologists.

A large party came from Darlington, most of whom took no part in the excursion but they made the attendance at the tea and meeting total up to sixty ; seven Societies responded to the roll call and Mr. J. Meikle Brown took the Chair.

The distance traversed did not allow for intensive collecting. We took field paths up to the moor where the Fine-leaved Heath made a vivid colour display not seen on West Riding moors. It was accentuated by the paler blooms of the Cross-leaved Heath; the Common Ling was only just coming into flower.

**Flowering Plants** (E. R. Cross): The excursion was well attended and very successful. It proved a glorious day, the moors were just beginning to show autumn colours and the cliffs, woods and sea were a perfect sight.

Quantities of *Drosera rotundifolia* L., made a fine display on the moors, and in the woods the ferns were in fine condition. *Dryopteris Filix-mas* (L.) Schott. had fronds about five feet long. There was abundance of Lady Fern and Hart's-tongue, and the walls in places were covered with *Polypodium vulgare* L. In the woods also were fine clumps of *Carex pendula* Huds., and *C. sylvatica* Huds. *C. distans* L., was noticed in one or two places. In the fields the Butterfly Orchid (*Platanthera bifolia* (L.) Rich.) was seen, also many fine specimens of *Orchis maculata* L. In the cultivated fields quantities of Corn Crowfoot (*Ranunculus arvensis* L.) were specially noticeable.

Mr. Alan Garton adds the following species as having been seen in Ramsdale and on the cliff: *R. hederaceus* L., *Vicia sylvatica* L., *Myrrhis odorata* (L.) Scop., *Daucus Carota* L., *Lactuca muralis* (L.) Fresen., *Linaria minor* (L.) Desf., *Listera ovata* (L.) Br., *Epipactis latifolia* (L.) All., and *Ophrys apifera* Huds. On the moors to the south *Hypericum elodes* L., and *Narthecium ossifragum* (L.) Huds., were seen.

**Mosses and Lichens** (C. A. Cheetham): The white-leaved fork moss, *Leucobryum glaucum* Schp., was widespread, and where the heather had been fired the white dead masses stood out boldly. The variety *ericetorum* B. and S. of *Hypnum cupressiforme* L., was abundant amongst the heather, with plenty of *H. Schreberi* Willd., bosses of *Polytrichum commune* L., and some *Webera nutans* Hedw., in fruit. The lichen most plentiful amongst the heather was *Cladonia sylvatica* (L.) Hoff., but there was a fair amount of *C. rangiferina* (L.) Web., *C. furcata* (Huds.) Schrad., *Cetraria aculeata* (Schreb.) Fr., and a little *Baeomyces roseus* Pers.

On the walls *Hypnum cupressiforme* L., took many forms with *Amblystegium serpens* B. and S., *Encalypta streptocarpa* Hedw., *Bryum capillare* L., and *Dicranoweisia cirrata* Lindb. Most of the lichen on the walls was *Parmelia saxatilis* (L.) Ach., and on the trees *Hypogymnia* (*Parmelia*) *physodes* (L.) Wats., and *Evernia prunastri* (L.) Ach.

**Fungi** (W. G. Bramley): Had more time been available the following list could no doubt have been much increased as little attention was paid to the woods. Some excitement was caused by the search for aecidia of *P. graminis* on half a dozen Barberry bushes, with the meagre results of two slightly infected leaves. This stage is by no means common in Yorkshire but later, near Tadcaster, the writer found it again though not in the quantity one would have expected following the fairly heavy infestation of several grasses the previous season. An attempt to produce the aecidia on *Mahonia aquifolia* from teleutospores on *Agropyron caninum* has also produced no results.

\* New to V.C. 62.

† Not in *Catalogue of Yorkshire Fungi*.

#### MYXOMYCETES

*Fuligo septica* Gmel.

*Ceratiomyxa fruticulosa* Macbr.

#### ASCOMYCETES

*Erysiphe graminis* DC., on wheat, oats, barley, *Dactylis*.

*E. polygoni* DC., on *Hypericum*.

*Pseudopeziza trifolii* (Biv.-Bern.) Fekl., on *T. hybridum*.

*Epichloë typhina* (Pers.) Fr., on *Holcus*.

*Endothella junci* (Fr.) Theiss. and Syd.

*Leptosphaeria acuta* (M. and N.) Karst., on nettle.

*Ophiobolus rubellus* (Pers.) Sacc., on *Heracleum*.

*Valsa ambiens* Fuckel, on hawthorn.



## BASIDIOMYCETES

- Ustilago avenae* (Pers.) Jens., on oats.  
*U. kuhneana* Wolff., on *R. acetosa*.  
*Phragmidium fragariastris* Schroet., II, on *P. sterilis*.  
*P. rubi* (Pers.) Wint., II, on *Rubus*.  
*Puccinia obtegens* Tul., II, on *Cirsium arvense*.  
*P. hieracii* Mart., II, on *H. boreale*.  
*P. hypochoeridis* Oud., II, III, on *H. radicata*.  
*P. saniculae* Grev., OI, on *S. europaea*.  
*\*P. chaerophylli* Purt., II, III, on *Myrrhis*.  
*\*Puccinia acetosae* (Schum.) Koern., II, on *R. acetosa*.  
*P. oblongata* Wint., II, on *Luzula sylvatica*.  
*P. graminis* Pers., OI, on barberry.  
*\*P. triseti* Erikss., II, III, on *T. flavescens*.  
*P. poarum* Niels., OI, on coltsfoot.  
*\*P. arrhenatheri* Erikss., II, on *A. elatior*.  
*Marasmius oreades* (Bolt.) Fr.  
*Hygrophorus reai* Maire.  
*Cyphella capuli* (Holmsk.) Fr.

## FUNGI IMPERFECTI

- † *Phomopsis crustosa* (Bomm., Rouss. and Sacc.) Trav., on dead holly leaves, det. Kew.  
 † *Dilophospora alopecuri* (Fr.) Fr., on *Holcus*, det. Kew.  
 † *Pycnothyrium junci* Grove, on *Juncus*, det. Kew.  
*Torula herbarum* Pers. ex Fr., on nettle stems.  
*Periconia byssoides* Pers. ex Corda, on nettle stems.

**Entomology** (J. M. Brown) : As insects have been scarce in the neighbourhood during the whole of the early part of the season, it seemed unlikely that they would be at all plentiful during the period of the excursion. This, indeed, proved to be the case, for although the district is a good one entomologically, on this occasion the entomologists had rather a poor time. Three species of Sawfly were seen, *Athalia lineolata* on *Veronica beccabunga*, *Tenthredo sulphuripes* and *T. perkinsi* on the flowers of *Heracleum*, but in smaller numbers than is usual. Hemiptera were not much in evidence, *Ischnorhynchus ericae* occurred on heather, *Anthocoris sarothamni*, *Orthotylus virescens*, *Heterocordylus leptocerus*, *Arytaina genistae* on broom, *Psylla peregrina* on hawthorn, *P. alni* on alder, while *Rhopalotomus ater*, *Calocoris norvegicus*, *C. sexguttatus*, *Plagiognathus arbustorum*, *Lygus pratensis*, *Leptopterna dolabrata*, *Philaenus leucocephalus*, and *Neophilaenus lineatus* were obtained by general sweeping. The Lacewing, *Kimminsia betulina* and the Caddisfly, *Silo pallipes*, can be added.

**Diptera** (C. A. Cheetham) : Amongst the two-winged flies the most interesting specimen had been caught by Mr. Brown in his garden the previous week. This was *Stratiomys potamida* Mg. This genus has not previously been caught in the county, in fact the Stratiomyidae family is very poorly represented in our list. It is difficult to think how this specimen came to be here.

Two large hover-flies were caught, *Volucella pellucens* L., and *V. bombylans*, and the silvery white *Argyra leucocephala* Mg., was plentiful on some damp woodland paths. The only mosquito noted was *Aedes punctor* Kirby (*Ochlerotatus nemorosus* Mg.). Amongst the dolichopods, *Ectomus alpinus* Hal., has only been recorded previously in the county in the Austwick area ; with it were *Campsicnemus curvipes* Flin., *Dolichopus unguatus* L., and *D. trivialis* Hal.

**Lepidoptera** (G. B. Walsh) : As has been the case during the whole of the year, insects were very scarce. After some fruitless work with beating tray and sweeping net, looking for beetles, the rest of the time was spent with two keen young entomological members of the Scarborough Society, Michael Ellison and Eric Owston, searching for Lepidoptera. The following butterflies were seen in flight : Small Tortoiseshell, Red Admiral, Meadow Brown (very plentiful), Ringlet and Common Blue. Other members of the party noted, in addition, Painted Lady, Small Pearl-bordered Fritillary, Small Heath, and Green-veined White. The few moths seen included Beautiful Carpet, Magpie (with cream background to the wings), Common Snout, Chimney Sweeper and Common Carpet.

The following larvae were found, but only in small numbers : Emperor Moth, Oak Eggar, Poplar Hawk, Clouded Buff, Silver Y, and Large Ranunculus (*Polia flavicincta*).



## THORNE WASTE, August 3rd.

Rain during the early morning spoilt the day for the entomologists, the tall growth of grasses and ferns being much too wet for sweeping until late in the day and as no bird men attended this meeting the botanists had the outing almost to themselves. They were fortunate in having Dr. J. M. Taylor as guide and counsellor and so had a profitable and instructive time as Mr. G. A. Shaw's report shows. The Waste is some three miles from Thorne, but fortunately our guide was able to transport the party in his car by detachments.

**Flowering Plants** (G. A. Shaw): A general survey of the flora of Thorne Waste is given by Dr. W. A. Sledge in *The Naturalist*, 1941: 266.

The morning was spent in the boggy thickets on the south-west margin of the Waste. Here we were shown the one surviving plant of *Lathyrus palustris*, a few plants of *Peucedanum palustre*, and the hybrid *Dryopteris dilatata* x *D. spinulosa*. Other interesting plants seen about here were *Ranunculus sceleratus*, *Viola canina*, *V. stagnina*, *Hypericum quadrangulum*, *Corydalis claviculata*, *Stellaria glauca*, *Potentilla palustris*, *Lythrum Salicaria*, *Lysimachia vulgaris*, *L. Nummularia*, *Scutellaria galericulata*, *Centaurium umbellatum*, *Myrica Gale*, *Elodea canadensis* (in flower), *Carex gracilis*, and *Calamagrostis lanceolata*. The most outstanding of the above was without doubt *Viola stagnina*, for a full account of which see the article by Dr. W. A. Sledge in *Naturalist* 1943: 77. The flowering of *Elodea* is an uncommon occurrence, and for further notes on this, reference should be made to an illustrated article by Mr. A. Malins Smith in *Naturalist* 1941: 125.

In the afternoon Dr. J. M. Taylor kindly took some members to a lane near Fishlake, where the true *Carex vulpina* L., was seen, along with *C. elongata*, *Nasturtium amphibium*, and *Oenanthe Phellandrium*. A fine patch of the Flowering Rush (*Butomus umbellatus*) was seen by the Don and on the edge of a nearby pond, *Oenanthe fistulosa* was seen, while in the water *Hydrocharis morsus-ranae* and *Ceratophyllum demersum* were flowering.

For a description of *Carex vulpina*, and an account of its discovery in Yorkshire, see an article by Dr. J. M. Taylor and Dr. S. P. Rowlands in *Naturalist* 1945: 131.

At Kirkhouse Green, a few miles west of Thorne, x *Carex axillaris* was pointed out in a ditch by the roadside.

**Mosses** (C. A. Cheetham): The interesting feature in the list of the mosses seen is the absence of plants normally plentiful such as *Hypnum cuspidatum* L., in the wet parts. Although not seen it is most likely there, but *H. cordifolium* Hedw., and *H. riparium* L., were plentiful in the places where one expected *H. cuspidatum* L. In the woods *Mnium hornum* L., was not easily found and I did not see any *Plagiothecium* or *Dicranella*, the woodland mosses being *Hypnum cupressiforme* L., var. *ericetorum* B. and S., with masses of *Polytrichum commune* Hedw., *Sphagnum fimbriatum* Wils., and *S. squarrosum* Pers., var. *subsquarrosum* Russ. Mr. A. Thompson kindly identified the sphagna. On a fallen tree *Aulacomnium androgynum* Schwaeg., was plentiful with *Dicranum scoparium* Hedw. Some small lots of *Eurhynchium praelongum* Hobk., *Hylocomium squarrosum* B. and S., *Brachythecium purum* Dixon, and *Climacium dendroides* W. and M., were also seen.

**Entomology** (W. D. Hincks): The area proved to be one of the most promising from an entomological point of view, that the Union has visited for some time. Unfortunately a heavy shower before we arrived prevented any serious sweeping until shortly before it was necessary to leave on the return journey.

The only grasshoppers seen were *Omocestus viridulus* (L.) and *Chorthippus bicolor* (Charp.). A few dragonflies, *Sympetrum striolatum* (Charp.) were observed. The most interesting Coleoptera were the lovely *Chrysolina fastuosa* (Scop.), taken sparingly on *Galeopsis Tetrahit*; on *Linaria vulgaris*, *Gymnetron antirrhini* (Payk.) and *Brachypterolus pulicarius* (L.); on aspen, *Zeugophora subspinosa* (F.); on poplars and willows, *Chalcoides fulvicornis* (F.), *Chrysomela populi* L., *Phyllodecta vulgatissima* (L.) and *P. vitellinae* (L.). Other beetles included *Glischrochilus quadripunctatus* (L.), *Antherophagus pallens* (F.), *Cryptocephalus pusillus* (F.), *Psylliodes cuprea* (Koch), *Phalacrus coruscus* (Pz.) and *Olibrus aeneus* (F.). Diptera were very plentiful and would prove a distraction on a hot day. *Larvaevora* (*Echinomya*) *grossa* (L.) was taken by Mr. Wood. *Sciara thomae* (L.) was common

and Mr. Wood took a single specimen of the robber fly *Leptogaster cylindrica* (Deg.). Hymenoptera were not numerous owing to the unfavourable conditions. Those taken include *Tenthredo viridis* L. (*sensu stricto*), *Tenthredopsis nassata* (L.), *Macrophya rapae* (L.), *Hemiteles areator* (Pz.) and the curious brachypterous Chalcid *Macroneura vesicularis* (Retz.) (*Eupelmella saltator* (Lind.)). The last species, a parasite of gall-midges attacking cereal crops, is an interesting addition to the county list and was swept at the edge of a corn field.

**Diptera** (C. A. Cheetham): Around the muddy ruts on the roadway the two-winged flies caught were *Argyra leucocephala* Mg., *Dolichopus longicornis* Stan., *Gymnopternus aerosus* Fln., and *Parhydra quadripunctata* Mg. The only biter was the cleg, *Haematopota pluvialis* L., but the troublesome *Hydrotæa irritans* F., was plentiful.

On the tall-flowering Umbelliferae and the Valerian the most interesting of the flies were found and here amongst the large Hoverflies the two species of *Ischyrosyrphus*, *I. glaucius* L., and *I. laternarius* Müll., were plentiful; they are uncommon but when found they are generally numerous. The most uncommon *Syrphus* was *S. tricinctus* Fln., and there was also one or two of the black *Chrysogaster solstitialis* Fln., and *Ptychoptera contaminata* L. The very large tachinid, *Echinomyia grossa* L., and a smaller species, *Pryxe vulgaris* Fln., were fairly frequent. Tipulids were scarce, the only one caught was *T. paludosa* Mg., but the wet vegetation was the reason for this absence.

**Arachnida** (A. C. Braham): The borders of the occupation road leading south to the peat moor, and the divergent paths winding east and west would, there is no doubt, have yielded an abundant harvest of spiders but for the sodden condition of the flora due to an early but heavy rainfall. Until well into the afternoon sweeping was almost impossible, then, fortunately, the sun appeared and a wind sprang up, drying the plants and bushes sufficiently for sweeping to be carried out. About thirty specimens were taken resulting in ten species, amongst which were several of the handsome and distinctive spider *Aranea raji betulæ*, with their black patch set at the posterior of the white dorsal surface of the body. One or two specimens of the attractive and delicate *Theridion redimitum* were taken; these were of the variety having a bright-red, oval-shaped ring superimposed longitudinally upon a cream coloured body with pale greenish-yellow cephalothorax and legs. A single specimen of the *Clubiona subtilis* was captured. This spider, which is only about 4.5 mm. long, has a pale yellowish-green cephalothorax and legs with a sandy-red body devoid of pattern. As is usual in the vicinity of steams a few specimens of *Tetragnatha extensa* were taken; these are curious spiders with their slender delicately-patterned bodies, long front legs and elongated prominent chelicerae.

A complete list of the species taken is as follows:

- Aranea diadema* Linn., several varieties both ♀ and ♂.
- A. raji betulæ* Sulz., both ♀ and ♂.
- Meta reticulata* Linn., both ♀ and ♂.
- Drassodes lapidosus* Walck., ♀.
- Linyphia resupina domestica* Linn., ♂.
- Tetragnatha extensa* Linn., both ♀ and ♂.
- Theridion redimitum* Linn., ♀ Var.
- T. vittatum* Clk., ♀.
- Clubiona subtilis* L.K., ♀.
- Aranea sturmi* Hahn., ♀.

There is no doubt that, given a fine, dry day, preferably hot, this area would prove to be a rich collecting ground and it is to be hoped that our next visit here will be such a day.

**Trichostomum tenuirostre** Lindb., a Moss new to V.C. 63.—At Sun Wood, near Coley, between Halifax and Bradford, I collected the above moss on a rock outcrop situated on the Lower Coal Measures. The moss is in small quantity and in rather poor state, the habitat being drier than that usually given. The other associated bryophytes were usual to the area. The record has been confirmed by Mr. J. B. Duncan.—H. Walsh.

## BOOK REVIEWS

**The Identification of Conifers**, by A. B. Jackson. Pp. 152, Edw. Arnold & Co., 9/-.

Dallimore and Jackson's *Handbook of Coniferae* has been a standard work for over twenty years, but there has long been a need for a pocket book usable in the field for the identification of conifers in cultivation in this country, and the present work, which forms a condensed edition of and introduction to the *Handbook*, has been prepared in response to this demand. The keys to the genera and species are based on those in the larger work and include all conifers grown in the British Isles save a few rare and tender species limited to specially mild and favoured regions. Brief information under each species of the country of origin, dimensions attained by the tree in its native country, date of introduction, growth, form, and outstanding characteristics, is followed by references to noteworthy trees in cultivation in parks and gardens. From this we learn that the tallest living conifer in Britain is a specimen of the Oregon Douglas Fir (*Pseudotsuga taxifolia*) at Powis Castle, Welshpool, which measures 168 ft.  $\times$  11 ft. The tallest Spruce (*Picea Abies*) is at Studley Royal, Ripon, with dimensions of 150 ft.  $\times$  14 ft., and the same size is reached by a specimen of the Californian Redwood (*Sequoia sempervirens*) at Lyndhurst. The book is illustrated by forty-eight of the drawings made by Miss G. Lister for the *Handbook*, and the nomenclature has been revised and brought up to date. This slim volume, which slips easily into the pocket, is a welcome and invaluable aid to field work, and both author and publishers deserve the thanks of all gardeners, foresters and students for its production.

**Ilfracombe Fauna and Flora**, edited by Mervyn G. Palmer. Pp. xiv+266. Jas. Townsend & Sons, Ltd., Little Queen Street, Exeter, 7/6.

The Ilfracombe Field Club was founded in 1933, its primary object being the compilation of the flora and fauna of the district, which extends to a radius of 10 miles of the town and covers about 100 square miles. The district is very diversified topographically and includes Lundy Island and Braunton Burrows, two regions of outstanding interest to the naturalist. For a Field Club which has been in existence for so short a time, nearly half of which has been a period of extreme difficulty, this record of its activities and achievements is a truly outstanding piece of work. It bears witness to a remarkable degree of co-ordinated energy and enthusiasm guided and directed by wise leadership. It is essentially a book of records, 'the bare bones for others to cover with flesh,' as Dr. Wallis says in his foreword. As such it follows in the steps of many previously published lists by other Field Clubs, but it surely sets a new and higher standard for such work, both by its comprehensiveness, accuracy and attractive presentation. Recorders in the various groups have sought the assistance of specialists, and in addition to the intensive field work involved, collections have been searched and thousands of published references checked. The groups covered range from Mammals to Sponges and from Flowering Plants to Algae, with a grand total of 4,868 recorded species. Each group is prefaced by an introduction by the recorder and tabulated and comparative numerical census of all recorded British and Ilfracombe families and species, and is followed by the species-list giving frequencies, habitats, and other data, and concluding with a generic index. The classification and nomenclature adopted are those of the most up-to-date handbooks and lists. There are also nine photographs of animals and plants, and a map of the area covered by the survey.

It is inevitable that in such an ambitious undertaking there should be some inequality of treatment. It is not surprising that recorders have not been found to cover all groups. Only the Lepidoptera (779 spp.) and Coleoptera (1,257 spp.) amongst the insects have been adequately worked. The list of Diptera (101 spp.) is based almost entirely on a fortnight's collecting. The Odonata are very incomplete with only seven species recorded, whilst the Hymenoptera, Orthoptera and other groups of insects are omitted. The records for Spiders also refer only to those collected on Lundy Island. The ornithological section includes notes on 260 birds, and a separate section is appended on the birds of Lundy. The list of Flowering Plants owes much to the *Flora of Devon*. The nomenclature of that work has been followed, though it is not clear why it has been decided to print all specific names in this group with a small initial letter when capitals are retained in the bryophytes. Nor is it clear why some plants such as Snow-berry and Cedar



of Lebanon are included without comment as to status when others such as Fly Honeysuckle and Yew are said to be alien or doubtfully native. Amongst the non-flowering plants, the Mosses and Marine Algae appear to have received most attention; the lists for the other groups are largely the work of one member and a great deal yet remains to be done before they approach completion.

The Ilfracombe Field Club has every reason to be proud of this outcome of its work, and special praise must go to Mr. Palmer who, in addition to contributing several sections to the vertebrate, entomological and conchological parts, has been responsible for editing the book as a whole.—W.A.S.

**Fisherman Naturalist**, by **Anthony Buxton**, pp. 190, with 39 photographic illustrations; Collins, 10/6. Major Buxton's latest book is published at a moment when nature reserves are in the news, especially his own Norfolk estate of Horsey, which he has recently offered to the National Trust on most generous terms. The author is an expert in both the recreations which provide the title for a fascinating volume. He gives his readers the secret of his success on the first two pages; concentration and optimism. The early part of the book is devoted to fishing, and Yorkshire fishermen will find interest in his memories of Driffeld Beck, while the less experienced will learn many tips helpful in the hooking, playing and landing of their fish, though using a terrier instead of a net is a risk that many would not care to take. The latter part describes his own Norfolk marshland, its animals and birds, and the great flood which, in 1938, covered hundreds of acres with brine, a catastrophe which, after the first initial shock, became a situation to be watched with growing interest. The book is profusely illustrated with photographs or strips of film and though, as the modest author is the first to admit, some of these do not quite reach the standard expected from the experts to-day, it must be remembered that many are action photographs illustrating such fleeting episodes as the "pass" of the Montagu's harrier, or the removal of slime from its head and neck by a bittern, by means of its own powder-puff.—R.M.G.

**Wild Exmoor through the Year**, by **E. W. Hendy**. Pp. 200, with 15—photographic illustrations. Eyre and Spottiswoode, 12/6. Few books published in 1930 are so well worth a new edition in 1946 as this revised and rewritten presentation of the coombes, crests and sweeps of Exmoor, with the wildlife they contain. Quite early Mr. Hendy informs us that "this book is not intended primarily for scientific naturalists;" yet it is probable that these experiences of an all-round naturalist in so rich a region, during the latter part of his life, will be of permanent value. A contoured map and a chapter containing elementary references to the geology of the area would have added to the book's value.

Beginning with the "turn of the year" the author takes the months consecutively, interpolating chapters dealing with special seasonal features. Thus, detailed observations of the Dipper follow "The Moods of March." April precedes a moderate statement of the case for bird protection. A Nightjar chapter comes between May and June, and "Exmoor Merlins" follows.

Much that is written might easily have been of areas of western or north-eastern Yorkshire. The coombes and spaces of Exmoor are comparable readily to areas of the smaller of our dales and gills (the little coombes are called goyals in Somerset). Bird life is similar, but Exmoor has an advantage in respect of the larger *raptores*, if not in breeding waders; and in the Stonechat and Woodlark, both scarce in Yorkshire, but off-set by our Pied-Flycatchers. The larger insects are more numerous in the coombes than in the gills, and the vegetation more luxurious.

August is preceded by a balanced argument against the opponents of stag-hunting (without which the red deer would disappear, says Mr. Hendy). Some of the best writing refers to the fall of the year, to country customs and superstitions, red deer, migrant birds, including some surprises.

Mr. Hendy's quietly descriptive prose is very effective. Obviously he keeps abreast of current literature for he culls notes from *The Naturalist*. The illustrations are well chosen. The book can be recommended to all lovers of wild moorland and of the life of moors and glens wherever situated. Visitors to West Somerset, or north-east Devon should take this book with them.—R. C.



**Bird Photography**, by G. K. Yeates, F.R.P.S. Pp. 116, and 48 plates by the author. Faber and Faber, 12/6. No one to-day knows more about this subject, from all its aspects, than the author, who, during the past 15 years has advanced from beginnerhood to leadership. The book deals fully with aims and ideals, apparatus (including hides), applications to all types of species, habitat and situation of birds, including the photographic technicalities peculiar to the subject. The 48 illustrations have been selected, not so much to show some of the author's best work (although many could be so considered by anyone) as to illustrate the various points and problems referred to in the letterpress, and to show examples of different types of work. Each portrait is accompanied by the relevant technical details of plate, exposure, stop, shutter and method used to secure it. To think of a descriptive method better calculated to help the beginner, or any who would advance, would be difficult. Capt. Yeates points out the faults in some of his own photographs and explains for the benefit of his readers how such might have been avoided—none is better able to do it—and without the ability to see faults in his own work no one ever made much progress.

The author writes well, whether dealing descriptively with his sport of photographing birds, with the technical details, or with broader aspects of natural history. He is well known as an author, and as a frequent contributor to the illustrated journals. A Yorkshireman, we hear he is likely to be resident in the county again before long.—R. C.

**Gall Midges of Economic Importance**, by H. F. Barnes, M.A., Ph.D. Vol. 1. **Gall Midges of Root and Vegetable Crops**. Pp. 108 with 10 plates, 12/6. Vol. 2. **Gall Midges of Fodder Crops**. Pp. 160 with 3 plates, 15/-. 8vo. Crosby Lockwood & Son, Ltd., 20 Tudor Street, London E.C.4. In the preface of his *List of British Diptera* (2nd edition) published in 1901, G. H. Verrall, the founder of British Dipterology, wrote, "a fairly complete 'List' could be issued if only some sharp-sighted young entomologist would master the Cecidomyiidae." It was more than twenty years before the "sharp-sighted young entomologist" took up his task. Since that time Dr. Barnes has worked steadily at the family producing a great volume of published work of the highest order. The outcome of his labours is the present projected series of eight volumes dealing with the Gall Midges of economic importance of the world. Volumes 1 and 2, dealing with Gall Midges of Root and Vegetable Crops and Fodder Crops respectively, are now before us. Volumes 3 and 4, dealing with Gall Midges of Fruit and of Ornamental Plants and Shrubs, are forecast for Autumn 1946. In 1947 volumes 5-8 will appear, dealing with the Gall Midges of Trees, of Miscellaneous crops, of Cereal Crops and finally Miscellaneous (zoophagous, fungivorous and those that attack weeds).

A foreword to the first volume is contributed by C. T. Gimmingham, O.B.E., B.Sc., F.R.I.C. and to the second by Gwilym Evans, M.Sc. After an introductory section, volume 1 deals with the various Gall Midges recorded from root and vegetable crops under alphabetically arranged host plants. The main pest species are dealt with in detail whilst species which have not yet been recorded as pests are treated incidentally in the text matter dealing with each host plant. A vast amount of information has been compiled from the impressive bibliography of 228 titles, but much detail is the result of original work by the author. The bibliography is followed by separate indices to Gall Midges, Plants and general matters. Volume 2 follows much the same lines but is divided into three sections, (1) dealing with the Gall Midges of Clovers, Medicks, Trefoils, Vetches, etc., (2) Gall Midges injurious to Grasses, and (3) Gall Midges of miscellaneous fodder plants.

The matter is dealt with, of course, entirely from the point of view of the economic entomologist for whom these volumes are primarily intended. It is not Dr. Barnes' intention to provide for the identification of the different species, except by the details of host plants and damage which he includes. Identification by this method is sometimes hazardous and the systematist will regret the omission of morphological data. References to the original descriptions are included but these are often worse than useless. The systematist will readily agree with the author that too many species have already been based solely on gall characters, differences of host plant and similar non-morphological details. It is true, however, that the damage to the host plant is as much a characteristic of the species as are

its morphological attributes and a combination of the two is perhaps the only way to render the identification of these small flies possible to workers other than specialists.

Control measures are very fully dealt with, based on the literature, and the details relating to natural enemies and parasites are a welcome feature. It will be noted that the author uses the family name Cecidomyiidae, consistently misspelling it Cecidomyidae—a small point. The genus on which this name is based is *Cecidomyia* Meigen, 1803, and the family name is formed by adding -idae to the stem, thus: Cecidomyiidae. In any case, under the International Rules of Nomenclature, this name is invalid and Itonididae based on *Itonida* Meigen, 1800, must be used. However, few entomologists are likely to oppose the conservation of the hitherto almost universally adopted Cecidomyiidae, but dipterists should not delay in presenting their case for its inclusion in the "List of Nomina Conservanda" as the validity of Itonididae is causing its increasing use, thus rendering more difficult a decision to conserve the invalid name.

The illustrations are not very satisfactory, in fact plate 7 of volume 1 is a tragedy. The text, however, is a delight to the right kind of reader. Its wealth of data, widely scattered in the original, concisely and clearly presented, appeal to the reviewer as a particularly praiseworthy and valuable contribution to entomology. Every economic entomologist in the world will of necessity want access to the work. Amateurs and others interested in the relations between plants and insects, in galls, or in the order Diptera, will also find the series of the greatest value.—W.D.H.

**Darwinism and Human Life**, by J. Arthur Thompson. Pp. 144, 10/6.

**Science Old and New**, by J. Arthur Thompson. Pp. 192. Andrew Melrose, Ltd., 10/6. Though the march of scientific progress advances along ever increasingly specialised lines of research, the appearance of new and able exponents of its achievements and outlook keeps pace with its advances. The late Professor Thomson acquired a high reputation and wide popularity in his day as a lucid and versatile writer on biological themes and these two books are re-issues of works which first appeared many years ago. *Darwinism and Human Life* was first published in 1910 and the present issue though claimed as a sixth edition is in fact a third reprint of the third edition which appeared in 1916. Though much of the content of this book is fundamental, the intervening thirty years have witnessed many advances in cytogenetical and experimental research bearing on evolutionary views, with a consequent reorientation of ideas and shifting of emphasis. As recent works covering the same well-trodden ground are now available it is inevitable that this book 'dates' and is as lacking in freshness of exposition as it is in modern facts and outlook.

The second work consists of a collection of fifty-two essays on a wide range of natural history and evolutionary topics. The choice of subjects covers many intriguing biological problems and although a few of the articles are now out of date, the collection as a whole still retains most of the interest which made this one of the author's most popular works.—W.A.S.

**Friends in Fur and Feather** by Frances Pitt. Pp. 208, with coloured frontispiece and 84 photographic illustrations. Coun try Life, 12/6. Only a lifelong experience in the keeping of pets could produce a book of this kind. Miss Pitt is a well-known writer of natural history books and her regular readers have known for a long time that she has a flare for the training of wild creatures. Even these admirers are likely to be surprised at the wide range covered by Miss Pitt in this new book. The list of pets includes mice, voles, cats, squirrels, badgers, foxes, rabbits and hares, vipers and lizards, and many birds. Among the latter are owls, hawks, ravens, magpies and geese. It is obvious that the author has had opportunities for her delightful hobby which are not available to the average naturalist, and she has some good advice to give on the keeping of pets. As might be expected, the book is a mine of information regarding the habits of wild creatures when in captivity. It is certainly a reliable guide for young people who feel the urge to tame and keep a pet. The illustrations are excellent and with one exception are of Miss Pitt's own pets.

**The Wellwood Heritage** by A. Percival Needler. Pp. 263. A Brown and Sons, Ltd., 6/-. This book covers a period of fifteen centuries of English history in following the fortunes of the same family imagined from Saxon times to the present day. It is written in a series of short stories which preserve a historical unity in that they take up the thread of this family chronicle at salient points in our national history. The treatment is, of course, domestic and romantic, its aim being to remain true to the spirit and letter of history without attempting in the least to be academic.

The **London Naturalist** for 1945 (pp. 104, 3/6, from the London Nat. Hist. Soc., London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1.) contains an excellent appreciation by J. E. Lousley of the life and work of William Curtis, author of the *Flora Londinensis* and founder of the *Botanical Magazine*, prepared in connection with an exhibition and commemorative meeting held to mark the bicentenary of the birth of this famous naturalist, on January 11th, 1946. The same writer also contributes an interesting review of botanical records for the London area for 1945. Other articles include 'The Neuroptera of the Home Counties,' by E. B. Pinniger; 'Cynipid Flies and Galls on Oak,' by J. Ross; 'Some Notes on Birds in Central Poland,' by D. A. T. Morgan; 'An annotated list of the Rhynchophora of Bookham Common,' by A. M. Easton; 'Plant Gall records for 1945' and the 'Plant Galls of Bookham Common,' by H. J. Burkill; 'The Mycetozoa of Epping Forest,' by J. Ross; 'An appreciation of L. B. Prout and his Work,' by E. A. Cockayne; together with shorter notes and sectional and official reports.

In the **London Bird Report** for 1945 (by R. S. R. Fitter, C. B. Ashby, and E. R. Parrinder, 1/6), 127 observers record 161 species and sub-species. A pair of Woodlarks nested in the Essex part of the area for the first time for 40 years. Two new heronries were discovered, 'almost certain' to have resulted from war-time disturbance to others previously known, breeding pairs at 6 heronries numbered 165 against 131 in 1944, and 138 in 1939.

The re-opening of Staines Reservoir to the public yielded interesting species, including Grey Phalarope, Black Tern, Little Gull, and Red-necked and Black-necked Grebe, the latter species occurring from August 12th to December 12th, with 21 as the maximum on September 21st.

Five Black-headed Gulls, ringed in St. James' Park in winters of 1939, 1942 and 1943, were recovered at the same place in winters of 1944 and 1945; and a Hammersmith winterer of 1943 was there again in 1945. The returns to the Bird-Ringing Committee of the B.T.O. include species not likely to have been ringed 'within 20 miles of St. Paul's Cathedral,' and possible confusion should be prevented.

R. S. R. Fitter discusses the Black Redstart, of which two or three pairs nested; but fewer singing, apparently mateless, cocks were reported than in 1944. Starling roosts in the London area are discussed by E. O. Köhn. Whole-page reproductions of the Wryneck and of each of a pair of Black Redstarts are included, with 29 pages of letterpress.

**Transactions and Proceedings of the Dumfriesshire and Galloway Natural History and Antiquarian Society.** Third Series, vol. XXIII, 1940-1944. Edited by R. C. Reid. Pp. 273, Dumfries, 1946, 10/-. The natural history contents of this volume are exclusively ornithological and entomological. Five papers dealing with birds have been read to the society during the year, but three of them are merely announced without being reported. Papers reported verbatim, entitled 'The meaning of the Names of some British Birds' (30 pages); and 'British Birds named after Persons' (14 pages); display the customary erudition of Sir Hugh Gladstone. In the last-named it is interesting to Yorkshiremen (in view of the Hazlewood scheme), to note the mention (and illustration) of the Bulwer's Petrel found dead near Tanfield in 1837 and now in the Yorkshire Museum. The discovery of Temminck's Stint breeding in Scotland in 1934 and 1936 by Edwards and Crapnell is also mentioned. There is much interesting matter of value for reference in these two papers if copies can be obtained, but the flavour is as much



etymological and historical as ornithological and one feels that space could advantageously have been given to a report of President A. B. Duncan's address on 'The Changes in Abundance of some British Birds,' of which little is said beyond the echo of his complaint of 'an almost complete absence of vital statistics of birds.' Such may be true of Dumfriesshire and Galloway, but is not so of many comparable areas of England. As one who has passed a number of happy ornithological weeks in different parts of Galloway, more than a quarter of a century ago, I was disappointed to find that the journal of this Natural History Society includes no attempt to give the status of species of birds during the years covered such as is yearly produced by many similar societies in England, even during the war years, with advantage alike to themselves and to British ornithology. Historical research in ornithology should not have precedence over the current topographical history of species; for to make such latter available for posterity is a duty of each generation of naturalists.—R.C.

Of the four entomological contributions 'The Social Wasps in the Solway Area,' by Arthur Duncan, includes useful simple keys to the British species of *Vespula*. Bertram M'Gowan continues his 'List of the Coleoptera of the Solway District of Scotland,' Part IV. The preceding parts appeared in the *Transactions* for 1912, 1914 and 1919. The author's tenacity is admirable and highly commendable, but it seems a pity to continue using Beare and Donisthorpe's long outdated British List of 1904 as a basis when three more recent ones have been published (1915, 1930, 1945). Part IV deals with the Staphylinidae and contains many very interesting records. The invalid use of the genonym *Homalota* seems incongruous and reminiscent of Dr. David Sharp's heyday after so many years use of the correct name *Atheta*. 'The Aquatic and Semi-Aquatic Hemiptera (Water-bugs) of the Solway District,' by E. S. Brown, is a valuable contribution on these well-studied insects. In 'The Aquatic Coleoptera of the Solway Up to Date,' Professor Balfour-Browne contributes another of his readable distributional studies on the Water Beetles. Twenty-two species are discussed.—W. D. H.

---

## CORRESPONDENCE

54 SOMERSET ROAD,  
BOLTON, LANCs.

To the Editor of 'The Naturalist.'

SIR,

### BIRDS FOUND DEAD.

I am able and willing once more to accept the function of a clearing house for any dead birds found in Yorkshire, to skin and preserve such specimens as justify it and to provide an annual report on the results obtained.

The first winter of the scheme, that of 1941-42, provided in this manner records of the continental races of the Chaffinch and the Redbreast, together with a small series of skins which has been deposited in the Yorkshire Museum. More, however, could have been done, had the response been more widespread, and it is hoped that during the coming season more members will send me any avian corpses in a reasonably fresh state which they may come across. Nothing, except house sparrows, can come amiss and it is further desired to provide a small series of skins for comparative purposes at Spurn.

Specimens should be sent to me at the above address and will be acknowledged.

Yours faithfully,  
ALFRED HAZELWOOD.

(Support for this scheme to use casualties without causing any is requested.—R. C.)

*The Naturalist*



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COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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EDITED BY

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1947.

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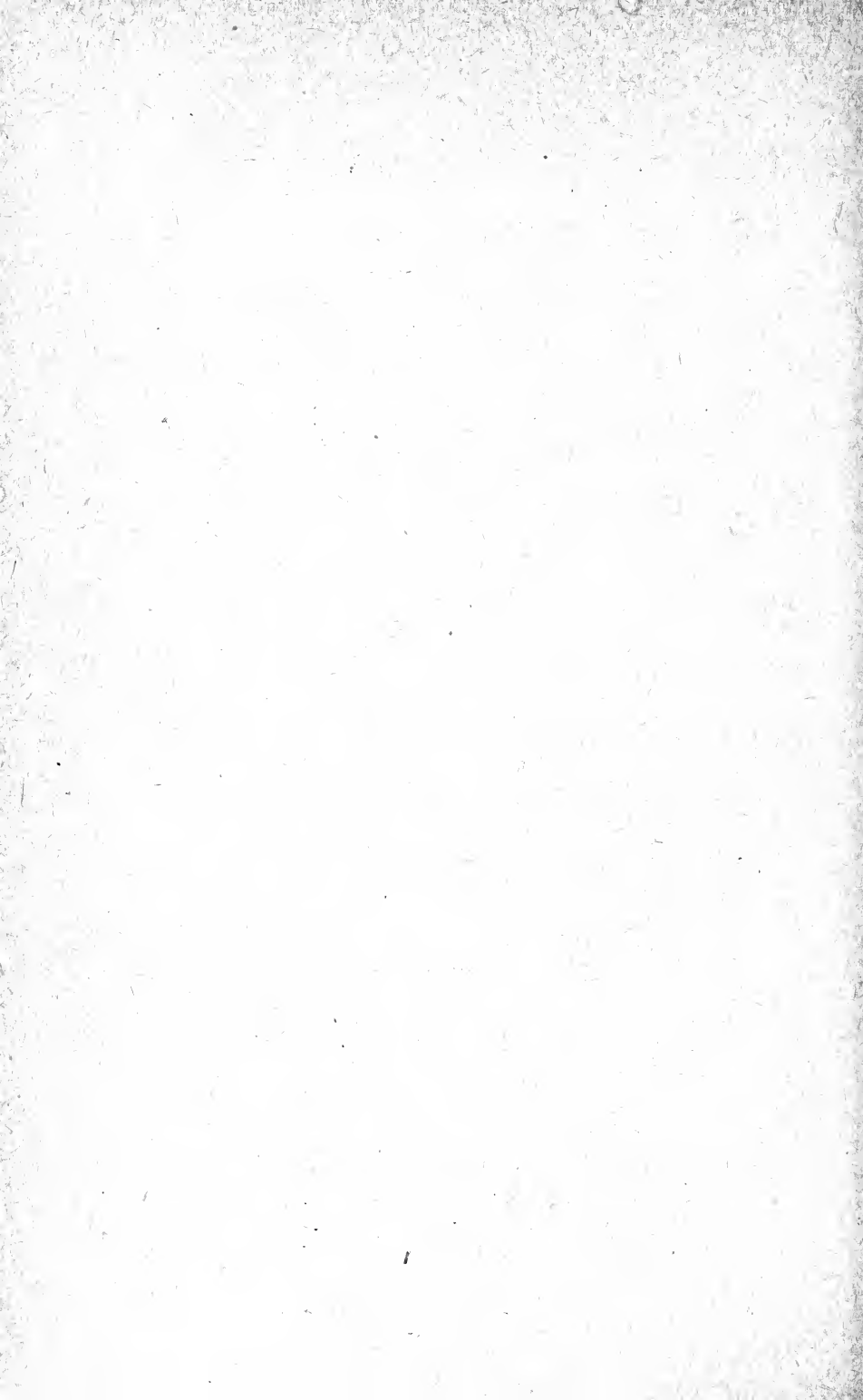
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# Yorkshire Naturalists' Union.

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## President:

Prof. W. G. FEARNSIDES, M.A., F.R.S., F.G.S., M.Inst.M.E., Sheffield.

## Hon. Treasurer:

S. D. PERSY FISHER, Sackville Street, Leeds, 7.

## Assistant Treasurer:

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

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## The 475th Meeting

WILL BE

## A Foray for the Study of MICRO FUNGI

WILL BE HELD AT

# Thornton-le-Dale

## From APRIL 11-13th, 1947

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## OFFICIALS

*Chairman:* Mr. E. W. MASON, M.A., M.Sc., F.L.S., Imperial Mycological Institute, Kew.

*Recorders:* Dr. J. GRAINGER, West of Scot. Agric. College, Auchincruive, Ayr.  
Mr. W. G. BRAMLEY, Spring Cottage, Pallathorpe, Bolton Percy, York.

*Secretary and Convener:* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Miss Maidment, Warrington House, Thornton-le-Dale, Nr. Pickering. Terms : 12/6 per day.

Members assemble, Thursday evening, April 10th.

**THE EXCURSIONS.**—Will be under the direction of Mr. E. W. Mason and Professor Chesters. Ground selected by them for working will include Forge Valley, April 11th ; Kingthorpe Woods, April 12th ; and if time permits, woodland west of Pickering.

**NEW WORKERS.**—If sufficient new workers on Micro Fungi are present an evening will be given over to starting them on " Micro " technique.

**A SHORT MEETING** will be held on Saturday, April 12th, when it is hoped there will be a discussion on " Records." The best means of keeping them up to date and available.

**WORKROOM.**—The workroom used last year will be available. If possible, will members bring their own microscopes, slides and mountants, also books dealing with Micro Fungi.

**MAP.**—Sheet 22, 1 inch Ordnance Survey covers the district.

If members require transport to Forge Valley, Friday, April 11th, will they please notify the Secretary as early as possible,

The Secretary will endeavour to deal with all suggestions and requests.



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CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Divisional Secretary :

Capt. J. P. UTLEY, B.Sc., Brompton, Northallerton.

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## The 476th Meeting

WILL BE HELD AT

# SCOTCH CORNER

On WHIT WEEK-END  
MAY, 24th to 26th, 1947

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**HEADQUARTERS.**—Scotch Corner Hotel, Middleton Tyas, Richmond, Yorks. (Telephone : Gilling West 243-4).

**TERMS.**—Single room (including breakfast and bath), 14/-. Double room (including breakfast and bath), 28/-. Breakfast (full), 4/-. Lunch, 4/6. Afternoon tea, 2/-. Dinner, 5/-. Inclusive terms, 25/-.

Members should write direct before April 30th, stating the accommodation required is reserved by Mr. Utley.

**TRAVEL.**—Members travelling by rail are advised to book to Darlington and then travel by United bus to Scotch Corner.

The South-North long distance buses all pass Scotch Corner, and members using this mode of travel will be put down at the hotel entrance.

There is a half-hourly bus service between Darlington and Richmond which passes Scotch Corner.

**ASSEMBLY.**—Members will assemble each morning at 10 a.m. Will all members with cars please make them available for the excursions.

**ROUTES.**—Saturday, May 24th : *via* Diddersley Hill to Forcett Park, Stanwick Park and Carlton Park, Return *via* Gatherley Moor.

Sunday, May 25th : From Hartforth up Smelt Mill Gill to Whashton Springs. Return *via* Sturdy Howes Lane to Whashton and Whashton Bridge.

Monday, May 26th : South down Great North Road to Skeeby Plantation, then *via* Parkgate Lane to Brompton Bridge, up Skeeby Beck to Skeeby Bridge and Gilling Beck to Gilling. Return *via* Sedbury Park.

Sedbury Park area, immediately west of the hotel, will be available all week-end for evening visits and for members not taking the longer excursions.

**MAPS.**—1" Ordnance Map, Sheet 14 (Darlington), shows all the area covered by the excursions.

**PERMISSION.**—Permission to visit has been very kindly granted as follows :

Forcett Park, by Colonel Waller.

Stanwick Park and Carlton Park, by H. Rickaby, Esq.

Smelt Mill Gill area, by Major Cradock.

Sedbury Park area, by Colonel Baker.

Members are requested not to disturb game or interfere in any way with the nests of game or any other birds.

Members are reminded that **no dogs** are allowed to be taken on the excursions or in the Sedbury Park area.

Members are requested to shut all gates that are used and to ensure that they are properly closed and securely fastened.

**GEOLOGY.**—The district generally is overlaid with drift, but the Howgill Anticline is widest at Middleton Tyas, whilst quarries in the Yoredale Series and the Magnesian Limestone are scattered over the area.

**BOTANY.**—Miss C. M. Rob, F.L.S., writes : Much of the area it is hoped to visit appears to be almost unworked botanically, in particular the Forcett-Stanwick area. Halnaby Car, once the only Yorkshire station for *Eriophorum gracile* (Roth), has dried up to a great extent ; it should be interesting to see what is left in this locality. *Pyrola rotundifolia* (L.) and *Ranunculus lingua* (L.) are both recorded from here, also the rare moss, *Thuidium blandovii*, but all seem to have suffered the same fate as the *Eriophorum*. Hedges in the neighbourhood are full of *Daphne laureola*. The woods of Smelt Mill Gill should prove interesting : Baker gives *Ribes alpinum* (L.), *Euonymus europaeus* (L.) and *Galium boreale* (L.) for this district, *Ulex gallii* (Planch.) for Gatherley Moor (confirmation of this record is desirable), *Sambucus ebulus* (L.) for Melsonby, and *Rosa rubiginosa* for hedges at Forcett.

Mosses are likely to prove of interest throughout the area.

**ORNITHOLOGY.**—This is essentially an area for the smaller birds, though a few ducks may be seen.

Most of the summer visitors should have arrived, and a watch should be kept for the Corncrake (*Crex crex*).

The severe weather during February and early March has had a serious effect on resident birds. Will members please note the status of all such birds seen on the excursions and particularly of the Wren (*Troglodytes t. troglodytes*).

Game birds will be nesting and special care is requested in the Forcett Park, Sedbury Park and Smelt Mill Gill areas.

**MAMMALIA AND REPTILIA.**—Little is known of the strength of wild animals, etc., within the area.

**ENTOMOLOGY.**—It has not been possible to obtain any records for this area, but certain localities should be productive.

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**Meeting.**—A General Meeting will be held at 6 p.m. on Monday.

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### **General Secretary:**

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## **The 477th Meeting**

WILL BE HELD AT

# **LINDRICK COMMON AND ANSTON STONES WOOD On JUNE, 7th, 1947**

**HEADQUARTERS.**—"Guest House," Hudson Farm, Shireoaks, Worksop, Notts., where Mrs. S. A. Adshead will provide tea at 5 p.m.

Plain Tea, 2/6.      Meat Tea, 3/6.

Owing to catering difficulties members requiring tea are asked to send a post card to Mrs. Adshead, stating what they require, by Saturday, May 31st.

**LEADER.**—Mr. John Brown, who has made intensive studies of the whole area.

**BUSES.**—From Sheffield (Pond Street): Corporation buses, Route 82 and 85, run hourly service, 15 past the hour. The 10-15 a.m. bus will reach the meeting place in time for the start.

From Rotherham (East Midland): Service 19 leaves Rotherham (All Saints' Square) at 10-15 for South Anston, 34 minutes past the hour.

**MEETING PLACE.**—South Anston Church. The party arriving from Sheffield 10-55 will wait for the Rotherham bus due 11-1 approximately.

**ROUTE.**—The party will proceed to Anston Stones Wood which lies five minutes walk north-east of the church. Follow road in the direction of North Anston, and after crossing Sheffield-Worksop main road, and passing under railway bridge, a gate a little beyond the bridge on the right hand side is the entrance to

Anston Stones Wood. The path is well defined and follows Anston brook through the woodland and eventually comes out on the main Sheffield-Worksop road near Lindrick Bridge. Proceed on main road in direction of Worksop and very soon Lindrick Common is reached. After passing over the Common the way is by Monks Bridge to Branciff and Grange, and finally to Shireoaks.

Return by buses (train is also available for return).

**MAPS.**—1 inch to mile, No. 46, Dukeries. 6 inches to mile Yorkshire West Riding C.C.C. N.E.

**PERMIT.**—For permission to visit Anston Stones Wood our thanks are due to Miss Mosey and Mr. E. W. Frith, F.R.V.A. (Clerk to Kiveton Park Rural District Council).

**THE DISTRICT AND THE GEOLOGY.**—Professor Fearnside writes : The Lindrick Common ground is the open top of a gently sloping dip slope of the Lower Permian (Magnesian) Limestone, there about 100 feet thick with scattered patches of clay and gravel remains of glacial boulder clay. The massive beds of Magnesian Limestone are cut at intervals by open joints which allow water to pass freely underground down to the floor of Anston Stones Wood gorge. The top beds are thin bedded and crumbly between the slabs, becoming decalcified in admixture with residual drift they weather to a red and in wet seasons a sticky tenaceous clay. At the east end of the links the limestone dips under Middle Permian marls thick enough to have been worked in former times for brick making, but interbedded with stone bands whose rejection is expensive. Sandhills towards Worksop are outcrops of Bunter extensively wrought and exported as loamy iron moulding sand. Their lower beds are more siliceous and sharper building sand, and where the red beds have been taken off the paler basal beds have been used locally for glass making.

The topography of the gorge in which is Anston Stones Wood deserves attention. Its stream gathers from a wide open valley between Todwick and Dinnington. Between North and South Anston it turns directly eastward towards the upstanding escarpment of Magnesian Limestone and as a misfit valley affords the South Yorkshire Railway a graded passage to its junction with the L.N.E.R. Sheffield to Worksop line. That main line railway follows the one-time route of ice melt waters flowing marginally along the Northern Pennines to the Trent and the crooked, narrow, deeply incised gorges such as that through Anston Stones Wood past Lindrick Common must be related temporary " in and out " marginal overflow ice water channels. The details of the system are not yet understood. From debris overhung by massive slabs of Magnesian Limestone in the wall of the gorge south-west of the golf links numerous mammalian bones and charcoal were unearthed during the war period, and it is hoped by further excavations to establish the local post-glacial chronology there.

**FLOWERING PLANTS.**—Professor Clapham writes : **Lindrick Common.** An area of rough grassland with much gorse on soil of varying depth over Magnesian Limestone, most of the part south of the Sheffield-Worksop road being golf links. The dominant grasses over most of the area are *Bromus erectus*, *Brachypodium erectum* and *Festuca ovina*, while *Helictotrichon* (*Avena*) *pubescens*, *H. pratense* and *Scleropoa rigida* are also found. The short broken turf of the golf links includes a number of interesting calcicoles, amongst them *Cerastium arvense*, *Cirsium acaule*, *Blackstonia perfoliata*, *Ophrys apifera*, *Carex ericetorum*, *Sagina nodosa* and *S. ciliata*, *Spiranthes spiralis* and *Allium oleraceum* also occur. In a marshy strip, with abundant *Deschampsia caespitosa* and *Angelica sylvestris*, *Senecio aquaticus*, *S. erucifolius*, *Samolus valerandi*, *Oenanthe fistulosa*, etc., may be seen.

**Anston Stones Wood.** A wooded gorge in the Magnesian Limestone, both picturesque and of great botanical interest. The tree flora has undoubtedly been modified by planting, but *Tilia cordata* and *T. platyphyllos* may both be native to the area. The roadside strip on the valley top appears to be old arable land planted chiefly with Sycamore. The cliffs carry *Taxus*, *Ulmus glabra*, *Sorbus aucuparia* and both *Tilia* spp., while on the sloping sides of the valley *Fagus* and *Acer* are prominent above but decrease downwards, while *Ulmus* and *Fraxinus* become



increasingly important and constitute 95 per cent. of the trees of the streamside flats. The ground flora is a mosaic of communities dominated by *Mercurialis*, *Scilla*, *Hedera* and *Allium*, with *Campanula latifolia*, *Lathraea squamaria*, *Hordeum europaeum*, *Agropyron caninum*, *Bromus ramosus*, *Milium effusum*, *Daphne laureola*, *Aquilegia vulgaris* and *Asperula odorata* amongst the more interesting associated species. Many ferns and bryophytes grow on the cliff face, and *Carex digitata* occurs in a few places on the north side of the valley. The area bordering the valley on the north side includes rough grassland and scrub with *Serratula tinctoria*, *Ophrys apifera*, *Anacamptis pyramidalis*, *Hypericum montanum*, etc.

**MOSESSES.**—Mr. John Brown gives the following list of the more uncommon species he has found in this area: *Archidium alternifolium* Schp., *Dicranella varia* Schp., *Dicranoweisia cirrata* Lindb., *Dicranum Bonjeani* De Not. var. *rugifolium* Bosw., *Fissidens crassipes* Wils., *F. decipiens* De Not., *F. adiantoides* Hedw., *Grimmia pulvinata* Smith, *Phascum cuspidatum* Schreb., *P. curvicolle* Ehrh., *Pottia recta* Mitt., *Tortula rigida* Schrad., *T. cernua* Lindb., *T. ambigua* Ångstr., *T. marginata* Spruce, *Barbula fallax* Hedw., *B. tophacea* Mitt., *B. rigidula* Mitt., *Trichostomum crispulum* Bruch., *T. tortuosum* Dixon., *Aulacomnium palustre* Schwaeg., *Mnium stellare* Reich., *Neckera crispa* Hedw., *Anomodon viticulosus* H. and T., *Brachythecium velutinum* B. and S., *B. albicans* B. and S., *Eurhynchium piliferum* B. and S., *E. tenellum* Milde., *E. murale* Milde., *E. confertum* Milde., *E. rusciforme* Milde., *Plagiothecium elegans* Sull., *Amblystegium flicinum* DeNot., *Hypnum riparium* L., *H. stellatum* Schreb. var. *protensum* Roeh., *H. cupressiforme* L. (a form near *elatum*), *Orthodontium gracile* Schwaeg. var. *heterocarpa* Wats.

**LEPIDOPTERA.**—Mr. J. Brown writes: My list of Butterflies and Moths seen in the area of the meeting is as follows: *Pararge megera* (Wall.), *Coenonympha pamphilus* (Small Heath), *Argynnis aglaia* (Dark Green Fritillary), *Vanessa atalanta* (Red Admiral), *V. cardui* (Painted Lady), *Aglaia urticae* (Small Tortoise-shell), *Nymphalis io* (Peacock), *Polyommatus icarus* (Common Blue), *Pieris brassicae* (Large White), *P. rapae* (Small White), *P. napi* (Green-veined White), *Euchloe cardamines* (Orange Tip), *Gonepteryx rhamni* (Brimstone), *Ochlodes venata* (Large Skipper), *Odezia atrata* (Chimney-sweeper), *Zygoena flippendulae* (Six-spot Burnet), *Abraxas sylvata* (Clouded Magpie). The Clouded Magpie is in some years exceedingly plentiful in Anston Stones Wood. A dilapidated specimen of the Grizzled Skipper was seen by a Sorby member in the vicinity of Anston Stones Wood two years ago. It is very likely to occur there.

**DRAGON FLIES.**—Mr. Bottomley writes: *Aeshna cyanea*, *Sympetrum striolatum*, *Pyrrhosoma nymphula*, *Coenagrion puella*, *Ischnura elegans*.

**ORNITHOLOGY.**—Mr. R. Chislett writes: Lindrick Common in June should show the usual birds of bush-dotted open spaces—Skylark, Yellowhammer, Linnet, Lesser Redpoll and Whinchat. The adjoining woods hold Turtle Doves and are good for warblers—Willow and Wood Warblers, Chiffchaff, Common and Lesser White-throats; several pairs of Blackcaps and Garden Warblers with a Sedge Warbler or two down by the waterways in company with the Reed Buntings, Moorhens, Wagtails and the Swallow tribe flitting above. Tits of the area include Great, Blue, Coal, Marsh (possibly Willow Tit) and Long-tailed. Goldfinches and Spotted Flycatchers occur. The commonest birds are the Chaffinch and the Blackbird these should be compared for frequency with the Song Thrush, Jay, Magpie and Carrion Crow. Sparrow Hawk and Kestrel, Little, Brown and Barn Owls are all in the neighbourhood. The Great Spotted Woodpecker is not rare and the Green should be noted. The Corn Bunting occurred two years ago in adjoining fields.

**MEETING.**—Following the tea at the Guest House, Shireoaks, 5 p.m., a meeting will be held to receive reports from the various sections and for the election of new members.

The Next Meeting will be that of the Entomological Section at Spurn, June, 13th-23rd. Details may be had from W. D. Hincks, 46 Gipton Wood Avenue, Leeds, 8. This will be followed by the meeting in V.C. 61 at North Cave on June 21st.



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CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Divisional Secretary :

Mr. C. W. MASON, 15 Park Avenue, Hull.

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## The 478th Meeting

WILL BE HELD AT

# SOUTH CAVE

On Saturday, JUNE 21st, 1947

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**HEADQUARTERS.**—South Cave Railway Station.

### TRAVEL FACILITIES.—

#### TRAINS FROM HULL.

	a.m.	a.m.	p.m.
Hull	8-31	11-50	1-12
South Cave	9-3	12-22	1-42

#### TRAINS FROM SOUTH CAVE.

	p.m.	p.m.	p.m.	p.m.
South Cave	2-49	6-10	7-0	7-46
Hull	3-16	6-40	7-28	8-16

#### BUSES.

Hull	8-55 a.m.	9-55 a.m.	11-55 a.m.	12-55 p.m.		
South Cave	9-47 a.m.	10-47 a.m.	12-47 p.m.	1-47 p.m.		
	p.m.	p.m.	p.m.	p.m.	a.m.	a.m.
South Cave	4-47	5-47	6-47	8-47	Selby	— 10-30
Goole	5-45	—	7-45	9-45	Goole	9-55 —
Selby	—	7-8	—	—	South Cave	10-48 11-49

Tea at South Cave Station at 6-0 p.m., followed by Meeting and reports.

**Note.**—Only tea and hot water will be provided with cups, all food must be brought.

**ROUTES.**—The naturalists will leave South Cave Station at 12-30 p.m. under the guidance of the Rev. D. E. Urquhart and Miss E. Crackles, B.Sc. The Geological Section will be lead by C. F. B. Shillito.

**PERMISSION.**—Owing to this being the breeding season for game birds two of the land-owners have not been able to give us permission, and on the excursion members are asked to keep to the footpaths and follow the excursion leaders.

**GEOLOGY.**—Dr. H. C. Versey writes : The principal interest in the area lies in the re-opening, for marling purposes, of certain old quarries near Hotham in the Lower Lias. These show zones of this formation lower than any exposed on the coast. Fossil records are therefore especially valuable especially in the lowest beds exposed. Between Hotham and the Wolds, an attenuated development of the Jurassic rocks may be examined in several quarries. Accurately located fossil records from the Millepore Oolite, the Kelloways Rock and the clays overlying it are valuable. The nature of the contact between these clays and the overlying Red Chalk should be examined especially for the existence of sandy detritus.

**ORNITHOLOGY.**—Messrs. G. H. Ainsworth and J. Lord write : The woods around South Cave are, in most cases, preserved, hence the scarcity of Carrion Crows, Magpies, Jays and Sparrow-hawks. The same reason is probably a contributing factor to the numbers of Willow Warblers, Garden Warblers, Blackcaps, and Whitethroats which may be seen. The Sedge Warbler nests there, and there have been reports of the Chiffchaff (an uncommon nesting bird in the East Riding) having been heard in the district.

The Tree Sparrow and the Tree Pipit should be looked for. Yellow Wagtails nest in the meadowland near South Cave, and the Pied Wagtail near the quarries, where Sand Martins are usually numerous.

Tree Creepers, Great Tits, Blue Tits, Coal Tits, Marsh Tits, Willow Tits and Gold Crests have all been observed in the locality. The Spotted Flycatcher is almost certain to be seen.

A watch should be kept for Mistle Thrushes which appear to have suffered severely during the past winter—they were there in normal numbers last year.

The Wheatear nests near Eastdale by the railway embankment, also the Whinchat. Swallow, House Martins and Swifts should be noticed over the village.

Three species of Woodpeckers have been known to frequent the woods.

The Little Owl, the Tawny Owl and the Barn Owl nest in the district, and there is reason to believe that the Long-eared Owl may still be found in the Pine woods. Redshanks should be noted in the low meadowland where an occasional Snipe may be seen. Green Plovers are almost certain to be seen also Pheasants, Common and Red-legged Partridges.



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## Deputy Divisional Secretary:

Mr. G. B. WALSH, Scarborough.

## The 479th Meeting

WILL BE HELD AT

# SLINGSBY

## On Saturday, JULY 5th, 1947

**HEADQUARTERS.**—"Grapes Inn," Slingsby, where Mrs. A. C. Barron will provide a meat tea at 5 p.m. Price 3/6 each. Please send postcard.

**LEADER.**—Mrs. E. Brown, The Schoolhouse, Slingsby.

**BUSES.**—Buses leave Malton (Hovingham Route) at 10-15, 11-15, 12-5 and 2-15, taking 19 minutes on the journey to Slingsby. Return buses leave Slingsby at 3-40, 5-40, 6-40 and 7-40. West Riding buses leave Scarborough (Northway Garage) every half-hour, starting at 5 minutes and 25 minutes past the hour; and take 65 minutes on the journey. Return buses leave Malton every hour and half-hour. West Riding buses leave York for Malton every half-hour, starting at a quarter to and a quarter past each hour. They leave Malton at every hour and half-past the hour. They take 45 minutes on the journey. A train leaves Whitby for Malton at 9-40, reaching Malton at 11-1. The return train from Malton leaves at 6-0, reaching Whitby at 7-12.

**MEETING PLACE.**—The Maypole, just opposite the School. This is the first stop in the village.

**ROUTE.**—The party will follow the Castle Howard road to Slingsby Bank Wood. Much land has been brought into cultivation during the War, so that it will be interesting to see what changes have been brought about in the flora and fauna.

**PERMIT.**—Castle Howard Estate Office has given permission.

**GEOLOGICAL.**—Mr. R. W. Crosland writes: The Village of Slingsby stands at an elevation of between 100 and 150 ft. above O.D. on the southern edge

of the ancient Lake Pickering. The soil is glacial and post-glacial deposit overlying Kimmeridge clay. An old sand and gravel pit near the 100 ft. level in Greendikes Lane just east of the village is reported to have provided many specimens of water rolled pebbles, including belemnites and other fossils and suggested to one observer that 'this probably marks the shore line of the lake.'

To the north the Carrs extend nearly 8 miles, nowhere more than 100 ft. above sea level, till the north side of the lake is reached near Kirbymoorside.

Near the line of the 'Street' the main Malton to Hovingham road, a fault occurs with a deep downthrow to the northwards. South of this fault rise the Howardian Hills, the south-eastern spur of the Hambletons. Going southwards from the village there is a gentle rise for about a mile to 325 ft., then a drop of about 100 ft. in a quarter of a mile, and further south gently undulating country. Over the whole of the rise Middle Oolites come near the surface, calcareous grits forming the highest parts, Oxford clay appearing when past the brow of the hill, and Killaways rock being traceable towards the 225 ft. contour lines; further south Lower Oolites appear.

Stone has been quarried locally for centuries, there are remains of quarry holes at several places along the south side of the Street. The main source of supply for building stone has undoubtedly been 'Slingsby Quarry' south of the Street and just to the west of the village, where the Coral Rag has been strenuously attacked. As usual in the Vale of Pickering local builders have not always been sure judges of the durability of the stone they have used and it is common to see in the same old wall stones as good as the day they were quarried and others that weather badly.

**BOTANY.**—Miss C. M. Rob writes: Dry ground to the south of the village should be good for lime-loving plants, *Campanula glomerata* and *Centaurea Scabiosa* are two plants of this category that are found in the area, *Crepis biennis* also occurs near the village. The wet ground to the north will no doubt have suffered from drainage, the streams were well cleaned just before the war, and it is unlikely that much will have been allowed to become overgrown. Members who are in this part of the area should keep on the lookout for *Potamogeton compressus*, L., recorded by Robert Teesdale, from *A Rivulet at Hovingham*, but not seen for many years if the record ever was confirmed.

**BIRDS.**—Mr. R. W. Crosland writes: No very recent record of bird-life in this district seems to be available. These notes require bringing up to date.

**HAWKS.**—Kestrel and Sparrow-hawk resident, Merlin expected on passage, Peregrine occasional. **OWLS.**—Barn and Tawny resident. Crows, Etc.—Carrion, Rook, Jackdaw common, Hooded common in winter, Magpie common, Jay common.

Besides Yellow Bunting, the common B. and Reed Bunting are resident. Spotted Flycatcher common, Pied Flycatcher varies much from season to season. Tree Creeper and Nuthatch probably resident. Chiffchaff, Willow Wren, Sedge Warbler, Whitethroat, Lesser Whitethroat all common; Blackcap, Garden Warbler, Wood Warbler and Grasshopper Warbler all reported rare. Goldcrest not uncommon. Goldfinch and Hawfinch not uncommon. Great Spotted and Green Woodpecker common. Lesser Spotted Woodpecker very rare. Stock Dove and Turtle Dove rare. Woodcock, Snipe, Sandpiper, Redshank all occasionally breeding. Water-rail, Jacksnipe rare. Nightjar rare. Great Grey Strike once shot here. Kingfisher, Dipper occasional.

A large variety of ducks visit the Castle Howard Lake from time to time. I have no record of those which may be expected to breed.

It has not been found possible to collect any information about other branches of Natural History, where there is apparently a virgin field for discovery.

**MEETING.**—Following the tea at the Grapes Inn, a meeting will be held to receive reports from the various sections and for the election of new members.

A good deal of information about the village can be obtained from *Slingsby and Slingsby Castle*, by Rev. A. G. Brooke, 1904. This has long been out of print, but copies may perhaps be found in various public libraries.

# Yorkshire Naturalists' Union.

---

## President :

Prof. W. G. FEARNSIDES, M.A., F.R.S., F.G.S., M.Inst.M.E., Sheffield.

## Hon. Treasurer :

S. D. PERSY FISHER, Sackville Street, Leeds, 7.

## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Divisional Secretary :

W. G. BRAMLEY, Bolton Percy.

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## The 480th Meeting

WILL BE HELD AT

# BURTON LEONARD

## On Saturday, JULY 19th, 1947

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**HEADQUARTERS.**—The Crown Inn, where tea will be provided, 5 p.m., but members must bring food.

**MAP.**—The area is included in Sheet 26 of the 1 in. Ordnance Survey.

**PERMISSION.**—Major Holliday has kindly given permission for the Copgrove Hall Estate. No dogs are allowed and game must not be disturbed. All gates to be shut and damage to crops avoided.

**TRAVEL.**—The Ripon—Harrogate United and the West Yorkshire Bus Service leave Harrogate, 9-35 a.m., arrive Burton Leonard, 10-4 a.m. Return, 6-6 p.m.

An hourly service passes Wormald Green, 2 miles away.

**ROUTE.**—Start, 10-30 a.m., via the Bottoms to Copgrove Hall. At the time of writing the lake is empty owing to a burst bank, work is proceeding and water may be in the lake on the excursion.

**BOTANY.**—Dr. Sledge writes : The most interesting ground for the botanist near to Burton Leonard is the old magnesium limestone quarries at The Bottoms. The flora of these and of the aboriginal turf fringing them is rich in species characteristic of calcareous pastures. These include *Helianthemum chamaecistus*, *Polygala vulgaris*, *Linum catharticum*, *Genista tinctoria*, *Anthyllis vulneraria*, *Lotus corniculatus*, *Agrimonia eupatoria*, *Poterium sanguisorba*, *Rosa spinosissima*, *Asperula cynanchica*, *Scabiosa Columbaria*, *Carlina vulgaris*, *Picris hieracioides*, *Leontodon hispidus*, *Hieracium Pilosella*, *Campanula glomerata*, *Chlora perfoliata*, *Centaureum umbellatum*, *Gentiana amarella*, *Thymus serpyllum*, *Anacamptis pyramidalis*, *Orchis ustulata*, *Ophrys apifera*, *O. muscifera*, *Gymnadenia conopsea*, *Coeloglossum viride*, *Carex ericetorum*, *Avena pratensis*, *Koeleria gracilis*. By a pond on the north side of the road between Burton Leonard and Copgrove, *Rumex crispus* × *obtusifolius*, *Carex elata* and *Alopecurus aequalis* may be seen. Another interesting locality is the marshy fields by the stream running north from Foster Flat ; here *Oenanthe Lachenalii*, *Crepis paludosa*, *Juncus subnodulosus*, *Schoenus nigricans*, *Carex dioica* and other interesting species occur, while *Cladium Mariscus* is plentiful in the wet wood on the west of the stream and *Calamagrostis canescens* grows in one area.

**GEOLOGY.**—Dr. H. C. Versey writes : The rocks of the immediate area all belong to the Magnesian Limestone. The division into a Lower and an Upper Limestone which is possible south of Knaresborough cannot be established near Burton Leonard, but the existence of a marl horizon in Monkton Moor Quarry suggests that the Middle Marls may occur in isolated patches which might be reflected in the flora. Immediately to the east, on the lower ground, is the hummocky area of the Marton-Grafton moraine which probably continues in a less obvious form on to the Magnesian Limestone.

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A Meeting will be held following the tea, 5 p.m., for the presentation of reports and election of new members.



## **Yorkshire Naturalists' Union.**

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### **President:**

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### **Hon. Treasurer:**

S. D. PERSY FISHER, Sackville Street, Leeds, 7.

### **Assistant Treasurer:**

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

### **General Secretary:**

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## **The 481st Meeting**

WILL BE THE

## **FUNGUS FORAY**

AT

# **MASHAM**

**From OCTOBER, 10th to 14th, 1947**

*Chairman:* Mr. E. W. MASON, M.A., Imperial Mycological Institute.

*Recorders:* Dr. J. GRAINGER, Plant Pathology Dept., West of Scotland Agricultural College, Ayr;

Mr. W. G. BRAMLEY, Spring Cottage, Pallathorpe, Bolton Percy, York.

*Convenor:* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Mrs. C. F. Bruce, Silverdale House, Masham. Terms 12/6 per day. Accommodation is limited.

**WORKROOM.**—There is one available at Headquarters. Members please bring their own books and microscopes.

**MEETING.**—The Annual Meeting of the Mycological Committee will be held on Saturday, October 11th, when the Chairman will speak on 'Wood and Bark Fungi.'

**PUBLIC MEETING.**—This will be held in the Women's Institute, Masham, on Monday, October 13th, at 7-30 p.m., when Mr. Bramley will talk on 'Fungi and the Farmer.'

**MAPS.**—Ordnance Survey Sheet 21, one-inch.  
Permission has been granted by Viscount and Viscountess Swinton per Mr. J. P. Bradford, to visit the Swinton Park Estate. Jervaulx Estate may also be visited by kind permission of Mr. Christie, per Mr. R. F. Maughan.

There is a bus service from Ripon to Masham.



# Yorkshire Naturalists' Union.

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## President:

Prof. W. G. FEARNSIDES, M.A., F.R.S., F.G.S., M.I.M.E., Sheffield.

## Hon Treasurer:

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## Assistant Treasurer:

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds.

## General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

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# Sectional Meetings, 1947

OCTOBER 4th.—SECTIONAL MEETINGS. **Freshwater Biological Section** Annual Meeting, Leeds Church Institute, 4-30 p.m. The **Conchological Section** will meet in the Geological Department of the Leeds University. **Geological Section** Annual Meeting, Leeds Church Institute, 2-45 p.m.

OCTOBER 11th.—The **Botanical Section** will meet in the Theological Library, Leeds Church Institute, 5 Albion Place, at 3 p.m., to consider the Annual Report and nominate officers for the Section and its Committees.

OCTOBER 18th.—The **Vertebrate Section** will meet at Leeds Church Institute, 5 Albion Place, at 3-0 p.m. and 6-0 p.m. to consider the Report and nominate officers. This will be preceded by meetings of the Committees for Ornithology, Mammals, etc., and Wild Birds and Eggs Protection Acts Sub-Committee.

OCTOBER 25th.—The **Entomological Section** Annual Meeting will be held at the Church Institute, Albion Place, Leeds. 3 p.m. to 5-30 p.m., Exhibits; 5-30 p.m. to 6 p.m., Tea interval; 6 p.m. to 8 p.m., approximately, Election of Officers, Records Reports, other business. Will members and visitors please bring exhibits. Tea will be provided but will all please bring food.

An **Executive Meeting** will be held in the Leeds Church Institute, Albion Place, on Saturday, November 1st, 1947, at 3 p.m. Will all members of the Executive please make a note of this date and time.

The **Annual Meeting** of the Union will be held at Huddersfield on December 6th, 1947.





# Yorkshire Naturalists' Union.

---

## President :

Prof. W. G. FEARNSIDES, M.A., F.R.S., F.G.S., M.Inst.M.E., Sheffield.

## Hon. Treasurer :

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## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

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W. D. HINCKS, M.P.S., F.R.E.S., M.S.B.E., Manchester.

A. A. PEARSON, F.L.S., Hindhead.

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## The 482nd Meeting

AND

## The 86th Annual Meeting

WILL BE HELD AT

# HUDDERSFIELD

IN THE

Tolson Memorial Museum, Ravensknowle Park

by invitation of the Ravensknowle Committee of the Huddersfield Corporation  
and the Huddersfield Naturalist, Photographic and Antiquarian Society.

On Saturday, DECEMBER 6th, 1947

**TRANSPORT FACILITIES.**—6 minute trolley bus service from Westgate. Waterloo bus, Nos. 71 and 73. Fare 1½d. to Grosvenor Road, opposite Ravensknowle Park.

**THE MUSEUM** will be open continuously all day to members and associates. The Museum contains a good series of exhibits relating to all branches of local natural history, and the specialist collections will be available for consultation. These include the Porritt Collection of Lepidoptera, with its extensive series of melanic forms, and other insects, the Morley Collection of Lepidoptera, the Foggitt Herbarium, and the Museum Collection of rocks and fossils.

**THE MEETINGS** will be held in the Woodhead Memorial Hall of the Museum.

10-30 a.m.—Sectional and Committees.

11-30 a.m.—Executive Meeting.

12-30 p.m.—General Committee.

**LUNCH** will be provided for those requiring same at the Ravensknowle Cafe at a charge of 2/- each. Afternoon Tea will be available at a charge of 1/3 each. Members and delegates desirous of having lunch and/or tea should advise Mr. E. W. Aubrook, F.R.E.S., Tolson Memorial Museum, Ravensknowle, Huddersfield, not later than Monday, November 24th.

The **ANNUAL MEETING** will be held in the Woodhead Memorial Hall at 2-30 p.m.

The Mayor-Elect of Huddersfield, Councillor V. Smith, J.P., will welcome the Union on their visit to Huddersfield.

The Treasurer and Secretary will give their annual statements and the President, Prof. W. G. Fearnside, M.A., will deliver his Presidential Address : " A Geological View of the Projected National Parks."

Will members of the **Executive** and **General Committee**, which includes all members of the Union and the Delegates of the Associated Societies, please note the above times. No further notice of these meetings will be sent.

*Hon. Secretary :* CHRIS. A. CHEETHAM.

# The NATURALIST

A MONTHLY  
ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND

(PUBLISHED QUARTERLY IN 1947)

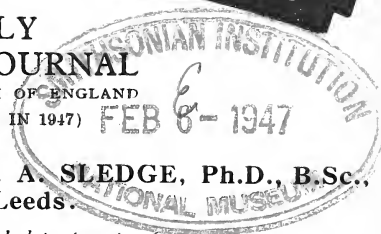
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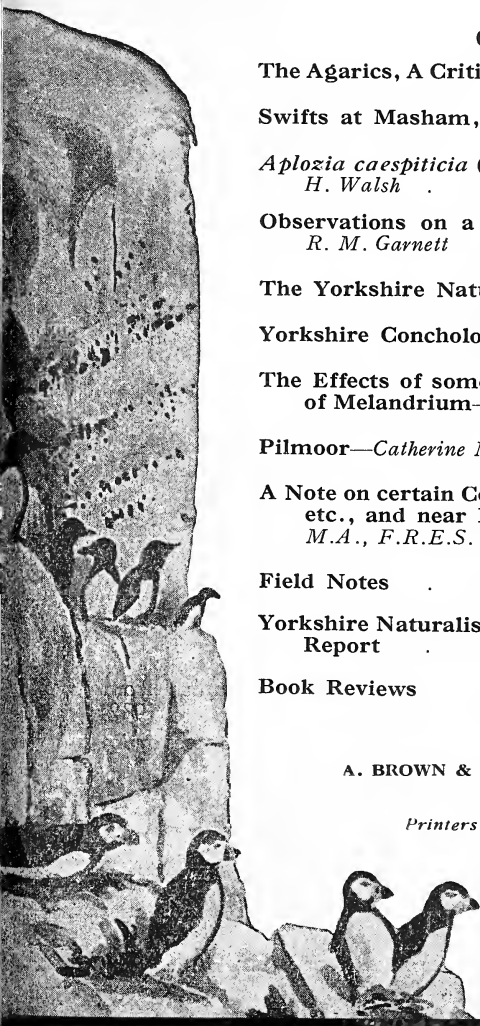
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## YORKSHIRE NATURALISTS' UNION

(VERTEBRATE SECTION)

### KILNSEA WARREN COTTAGE

---

THIS comfortable cottage has been rented by the Committee for Ornithology, and is now available for letting to Naturalists, with sleeping accommodation for five people. Crockery, cooking utensils, etc. are provided in the kitchen. Visitors who prefer can obtain their meals at the local cafe, ten minutes walk away.

The tenancy has been primarily acquired for ornithologists who will receive preference during the autumnal and spring migration periods (Mid-August to end October; and April-May). At other times it will be possible to fit in parties of botanists, ornithologists, etc., particularly in June and July, some of whom it is thought will take the opportunity to work in this region. The adjacent bird ringing-trap will only be used by authorised ornithologists.

The charge will be 3/- per night, or £1/1/- per week per person, payable in advance. Applications to one of the Hon. Secretaries (G. H. Ainsworth, 144 Gillshill Road, Hull, or J. Lord, 1 Lime Tree Villas, Sutton, Hull) should give dates required with alternatives.

The cottage has been prepared and furnished by the hard work and gifts of members and helpers of the Bird Observatory and Ringing Sub-Committee, and all persons using the cottage are expected to co-operate in keeping everything clean and tidy, and to remember the good name of the Union.

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## FOR SALE

### BACK NUMBERS OF THE NATURALIST

Complete sets are not available but numerous volumes from 1886-1905, and odd volumes and parts of other years, to 1932, can be supplied at 2/6 per volume or 6d. per part. Copies from 1933 can be supplied at cost price.

APPLY TO

**The Editors of the *Naturalist*, The University, Leeds, 2**

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**BINDING.**—Owing to increased costs of production the charges for binding *The Naturalist* and Parts 36 and 37 of the Y.N.U. Transactions are unavoidably raised to 6/- plus revised postal charge of 8d. on single volumes. A. BROWN & SONS, LTD., Perth Street West, Hull.



# THE NATURALIST

FOR 1947

## THE AGARICS A Critical Survey

A. A. PEARSON, F.L.S.

*Presidential Address to the Yorkshire Naturalists' Union, Doncaster,  
December 7th, 1946*

In a paper published in the January-March, 1945, number of *The Naturalist*, some details were given of the methods used by modern students of the Agarics by which the species can be more clearly defined. I also pointed out that a large number of names are to be found in our books—phantom species as they have been called—which have ceased to have any meaning and should disappear from our lists. During the last year or so I have, in collaboration with Dr. R. W. G. Dennis, been looking into this matter more closely, and we have set about the rather troublesome task of producing a list of Agarics, most of which at least may be considered as authentic British records.\* The total number of Agaric species which remain in the list is 1,229 as compared with about 1870 which are to be found in Carlton Rea's *British Basidiomycetae*, published in 1922, and in papers written since that date. This number does not include varieties which we have dealt with rather ruthlessly.

The specific names then have been winnowed to such effect that about one-third have been withdrawn and few of them are likely to reappear unless the names are adopted for the many agarics that still await description. Specific names have been withdrawn for various reasons.

1. **SYNONYMS.**—In many cases the same fungus has been described under another name; sometimes under many names. There are a few notorious cases. One of the most striking is *Tricholoma melaleucum* with a dozen or so different epithets to its credit in our English books—how many elsewhere it would hardly be possible to say. Many of these names will doubtless reappear now that so many species belonging to this group are being described or redescribed with diagnostic characters based chiefly on the size and shape of the cystidia on the gill edge. Whether such minor details are of specific significance is open to argument, but when there is serious doubt about the identity of a species, it is better that the name should disappear.

2. **NAMES ATTACHED TO INADEQUATE DESCRIPTIONS.**—If you look at the old books you will notice how the authors were often content with a short description which might fit a dozen different species. On the other hand some of these old authors delighted in long, chatty disquisitions about their finds, though inevitably they left out many details that we should deem to be essential. Others thought half a dozen lines enough to describe what they considered an unknown species. If the description were accompanied by a good coloured drawing the identity of the fungus might be clear to us to-day, but such drawings were not always there and not always good. The printer and the copyist intervened and were unable to reproduce exactly the colours of the original drawing. We know this happens too frequently with the coloured printing of to-day—but more on that subject later.

3. **SPECIES UNLIKELY TO BE IN BRITAIN.**—Some agarics have been recorded for this country by mistake probably, though it might occasionally happen that a fungus which normally grows in a warmer climate does occur in the northern countries. A good example is *Lactarius sanguifluus* closely allied to the common *deliciosus* which we all know is very variable, but the true *sanguifluus* which I have seen growing in large quantities in Spain is not likely to occur here. It has been recorded as far north as the Vosges mountains, and, of course, may have made a

\* The new list of Agarics which is the subject of this paper will shortly be published in the *Transactions of the British Mycological Society*.

fleeting appearance somewhere in Britain. The same may be said of other species doubtfully recorded in our books. They are best withdrawn until again met with. The most likely place for such denizens of milder climates is the south of Ireland, which has not been searched so intensively for fungi as other parts of the British Isles.

4. SPECIES WITH SEVERAL INTERPRETATIONS.—The same epithet has often been given to different fungi, usually a species that occurs so rarely that there is no tradition anywhere as to what the name really stands for ; but sometimes to a common species that it is difficult to define by field characters alone. We do not know which of the many interpretations applies to the fungus recorded for this country. I could give many examples ; let us take two from the genus *Mycena*. In the monograph of the genus *Mycena* by Robert Kühner, *Mycena plicosa* Fr. is recorded as *M. plicosa* (Fr.) *sensu* Smith, non Lange, non Ricken, non Velonovsky. In other words there are four different agarics recorded under this name, and Kühner has retained the epithet but adopted the interpretation of an American author. It seems to me best to scrap the name since there can be no consensus of opinion as to what it really means.

*M. lineata* (Bull.) Fr. For this species there are at least five different interpretations, and if I include my own it makes six. I consider it a pale form of *M. chloantha* Fr., which seems the best way out of the muddle.

Innumerable examples of this kind could be given, but I will spare you.

5. ERRORS DUE TO CARELESSNESS.—It is not easy to track these down. Some species just slipped in because Massee in his *European Fungus Flora: Agaricaceae* did not bracket the name and all specific epithets without brackets were indicated as British. Mistakes inevitably happen in all compilations—and elsewhere, too. Some years ago I used to name specimens of fungi for a friend and to my surprise later I found a number of unknown species duly recorded in a county magazine as having been vouched for by me. It transpired that my friend had ticked a list of species as the names came in, and in many cases put a tick against the wrong one. As the list of records was published without being sent to me for verification, the county flora was enriched by a number of very rare species—if, indeed, they can be said to exist at all !

6. ALIEN SPECIES.—Fungi often occur in hothouses on alien plants and are better excluded from the British list. Perhaps there should be a separate list of these as many of the fungi have probably not yet been recorded in the country of origin. If they are frequent they may perhaps appear in the lists because they will often have to be identified.

There are probably other reasons which would justify the rejection of species which have been considered as part of the British Fungus Flora, but I have given enough to shew the difficulties in the way of compiling a list which shall contain only authentic records. That, however, could hardly be guaranteed since there are many species unknown to any living mycologist which may never be seen again, but which have distinctive characters enough to justify their retention among the British records—at least for a further period. Looking through Cooke's *Illustrations of British Fungi* you will come across a number of such species. A good instance from Yorkshire is *Pluteus violarius* Massee. In the figure drawn by Massee himself published on Plate 311 (518) of Cooke's *Illustrations*, you have what looks like a small purple-capped *Russula*, but with pink gills and growing on rotten wood. Nobody else has seen this agaric. As it is not described fully enough to satisfy modern standards we might omit it but feel it must exist, so have kept it in the list. Many well-marked but unknown species of Berkeley are retained for the same reason. One of the troubles is that we never know, unless we have the original drawing in front of us, whether the printed plate is an accurate representation. Very often it is not. Take *Nolanea rufo-carnea* Berk. In *Cke. Ill.* 364 (378) an agaric very like *Laccaria laccata* is given this name, but surely Berkeley of all men would not make this mistake ! Fortunately we had Berkeley's original figure to refer to where the colours are completely different from the plate, not in the least like *L. laccata*. It was thought best then to retain it in the list for the present though its identity is problematical. I could say more about coloured plates which are sometimes more imaginary than genuine attempts to depict the living plant.

Let us turn to an even more troublesome matter : that of the priority of names. It occurs in the study of all groups of plants and animals, but mycologists think they have the worst puzzles to deal with in order to follow the International Rules of Botanical Nomenclature as defined in the last congress held at Amsterdam in 1935. I am not going to worry you with these puzzles except to give you two examples to illustrate the kind of decision one is called upon to make. With all fungi except Rusts, Smuts and Puff Balls the point of departure for specific epithets is the *Systema Mycologicum* of Elias Fries. For Hymenomycetes therefore it is Vol. I published in the year 1821. This old book is a youthful effort of the great Elias Fries and not a very good one, but it marked an epoch in the progress of fungus taxonomy. For the agarics it introduced the grouping by spore colour thus bringing some order out of chaos. It is, however, a controversial question whether this book can ever be a satisfactory basis for priority in nomenclature ; but there it is, with all its defects and we must make the best of it. If in some future congress another work be adopted for the starting point such as Bulliard's *Champignons de la France* (1809-12) or Persoon's *Synopsis Methodica Fungorum* (1801), our troubles would start all over again.

Here are the two examples to illustrate the procedure : *Lactarius turpis* is one of the commonest fungi under birches. Looking through the *Systema* we cannot find the name—but such a common agaric must have been there. In fact it is recorded under two names, *Agaricus necator* and *A. plumbeus*, so the specific epithet *turpis* must go, though it is a most appropriate name. There is some doubt about *necator* which had been used by Bulliard for another species so we adopt *plumbeus*—very regretfully since it is what Bresadola, who rejects it, calls a *nomen ineptum* ; but that is not a valid reason for rejecting a name.

Now take *Amanita spissa* Fr.—not quite so common but sometimes growing in large numbers in deciduous or coniferous woods. This, too, does not appear in the *Systema* and was first used by Fries in a later work, the *Epicrisis Systematis Mycologici* (1836) which perhaps would have made the best starting point for the agarics. In fact it is recorded in the *Systema* as *Agaricus (Amanita) excelsus* which name he substituted for Persoon's *Amanita ampla*, a little habit he had of replacing earlier names by those of his own choice. In this case there was a good reason since there was an *Agaricus amplus* also of Persoon, who had segregated *Amanita* as a separate genus and so had used the same specific epithet twice. Fries later gave the name *spissa* to what he thought was a different agaric, with a well-defined obconical sub-rooting base, but which we now know to be the same species, the *spissa* form having its base less deeply in the ground. Gilbert insists on using Persoon's original name *Amanita ampla*, but the valid epithet is *excelsa* and that has to go into our list whether we like it or not, *spissa* either being excluded or indicated as a form.

With this sort of thing I could go on for a long time. Sometimes the decision come to is not so conclusive and it is better to leave standing the old well known names wherever there is any doubt about the priorities. But where there is no doubt we have to cast overboard even the most familiar of names.

The same difficulties occur in connexion with varieties and here we have been somewhat relentless. Most varieties are better included in the description of the species, but first we have to be clear about the species itself. Take what one imagines to be the best known of all fungi—the field mushroom (*Psalliota campestris*). In Rea's book there are no less than ten varieties taken from old British records and it is doubtful if any of them, except the variety *alba*, which is the type, belong to this species. So we get rid of them all. That does not mean that field mushrooms are always consistently the same. Doubtless there are varieties, but they want studying afresh and describing in the light of our present knowledge of the genus—which is far from being as definite as it ought to be. I think it was the late Jakob Lange, the Danish mycologist, who first pointed out that *Psalliota campestris* was the only *Psalliota* with a fertile edge to the gill. The others have sterile cells, globose or cylindrical, on the gill edge. That at least helps us to define the species and its varieties whatever they may turn out to be.

Of course we are always face to face with the question so familiar to all naturalists, 'What is a species?' but I am not going to trouble you with that little matter. All that I am trying to do is to give you a few glimpses into the trials of a mycologist trying to put together a classified list of certain fungi in the light of modern experience. What is so often dubbed the juggling with names is

resented by many people, but is an obvious necessity if we want the same names for the same species to be used everywhere. It often occurs that an undescribed species is recognised in different countries and given different names. Only one can survive. Gradually the prior name takes its place in the records.

A much more difficult matter is that of new genera. After the sort of name sifting into the process of which I have tried to give you a glimpse, the question arises as to what general classification should be adopted and what genera to include or reject.

For more than a century the system for the agarics introduced by Fries has been used. There have been minor modifications but till recent years no substantial change. I am not referring to the *Systema*, which indeed is rather crude. The sub-generic names in that work are much the same as what we use to-day but it was in later works that the genera were more clearly defined, culminating in the *Hymenomycetes Europaei*, published in 1874 more than fifty years after the *Systema*. This work dominated mycological study for years afterwards and who shall say it does not still do so? The descriptions are short but Fries had produced another earlier work dealing with the agarics only, published in parts between 1857 and 1863: the *Monographia Hymenomycetum Sueciae*. This book contains long descriptions of about 1,300 species. From the modern point of view they are far from adequate because they do not give the microscopic characters which to-day we know to be at least as important as the field characters seen with the naked eye or a pocket lens, but it is a book that should be consulted far more than it is. Until recent times all attempts to upset the Friesian classification have failed. Quélet in 1888 introduced a new grouping which no one accepted though some of his genera have been adopted in recent years. The same may be said of the Finnish mycologist, Karsten. Fayod, a Swiss, made an elaborate study of the anatomy of the agarics in 1889 which was largely ignored, though his work has been more appreciated in later years. In 1887 and 1900 Patouillard propounded a new general classification of the Hymenomycetes which met with much acceptance in France and in England was in part only adopted for the agarics by Rea in his well-known book *British Basidiomycetae* (1922). All that really happened was a new shuffling of genera which were grouped in a different and rather disconcerting manner, spore colour no longer being of the first importance in the general set-up. A few non-Friesian genera were introduced but others proposed by Patouillard were not. On the whole the general framework of Rea's classification is not very satisfactory. Since then much water has flowed under the mycological bridges and our French colleagues especially have been busy. We have had important studies showing the development of many species from the size of a pin's head to maturity. We know that agarics may be either angiocarpous, semi-angiocarpous or gymnocarpous, meaning that the universal veil may be present from the beginning, may grow round the fruit-body after the first stages of growth, or not be present at any stage, so that the spore bearing surface is naked from the beginning. Large numbers of species have been described more fully, especially the microscopic features and even chemical reactions have acquired some importance in diagnosis. Many new genera have been proposed, and one of our tasks in putting together the framework of a list of agarics has been to take into consideration both the new matter and the old and decide how much of the new we should adopt.

I have to confess that we have shirked the issue and brought forward the inevitable compromise—the usual illogical English way of getting out of a nasty mess. We have, in fact, tried to get the best of both worlds. First we ignore all the theories of phylogenetic origin. After all, what do we know about the origin of the fungi? Unlike the vascular plants there is no trace of them in the earth's strata—or very little. What fungi are primitive and what are not? We may go from the simple to the complex or *vice versa* and one theory is as good as another, but the Friesian way is still the most practical. If we are to take into consideration all the evolutionary theories and somehow get them into our classification, we shall find we have a scheme that will be intelligible only to the few and will require a technique available only to the expert. So it is not a matter of very great importance in what order we place the genera so long as they are as near in character as appears most natural, taking into consideration both their microscopic and macroscopic features.

Let me not be misunderstood. I would not discourage attempts, however speculative to arrive at a more logical basis of general classification though they



may interest the philosopher rather than the taxonomist. A good example is that of the recent work of French mycologists who link up the fungi that grow above ground with those that complete their life history beneath the surface of the soil. Even the agarics have their homologues among the subterranean fungi.

For the present, however, we are more concerned with clearing up the many vexed questions of species. But even at this stage we cannot ignore the large number of new genera which correspond to natural groups having one or more features in common, so we have adopted the method which I introduced in 1938 in the List of the Fungi of Epping Forest, published by the Essex Field Club in the *Essex Naturalist*, Vol. XXVI. In this list the species are grouped under section headings and where the sections correspond with genera considered by some modern agaricologists to be worthy of separate generic rank, they are placed in brackets as contrasted with ordinary section headings which have no brackets. Thus while the old setting remains, the students can become acquainted with the new genera and can decide later whether to adopt them or stick to the older and more familiar style.

Let me now run through, very briefly, the more important genera, to give you some idea of how these are being split up:

**AMANITA.**—This genus remains intact with the exception of a small group represented in the British list by the rare *A. Vittadini* and the more common *A. echinocephala* which usually occurs on chalk soil. It has features which link it both to *Amanita* and *Lepiota*. The most easily recognised character is the colour of the spores which are greenish, though that would not constitute a new genus. For our purpose, on this occasion, I must refrain from going into detail. Gilbert has placed this group in *Lepidella*. In a more recent work Gilbert has put forward a classification of the *Amanitae* largely based on spore shape and the reaction of the spore to iodine. Some spores turn blue with iodine and are then said to be Amyloid. This occurs not only in *Amanita* but in species of many other genera and has had an important influence on the classification of the white-spored agarics.

**LEPIOTA** is split up into a large number of sections, including some that are thought to have generic significance. For instance:

*Limacella* (Earle) Maire, comprising a few species closely allied with *Amanita*. They have a viscid pileus and a volva which disappears in the early stages of growth and is not visible in the mature fruit body. The best known species is *Lepiota lenticularis*, a name which has to be replaced by *L. guttata*, which is the epithet used in the *Systema Mycologicum* and therefore has priority.

*Cystoderma* Fayod is a well-defined section of *Lepiota*, having a peronate veil on the stem which is confluent with the pileus. The common *L. amianthina*, *carcharias*, and others come into this section or genus as may also the uncommon *L. irrorata* with its subviscid pileus, included by some authors in a separate genus, *Lepiotella* Gilbert.

**ARMILLARIA** Fr. has a tendency to disappear altogether. In our list it is retained for *mellea* and *mucida*, both of which are placed in other genera by some authors. The remaining species are placed under *Tricholoma* and *Lepiota*. This, more or less, follows the lines drawn by Fries himself, who divided up *Armillaria* into groups respectively akin to *Tricholoma*, *Clitocybe*, *Pleurotus* and *Collybia*.

**TRICHOLOMA** Fr. has been cut up a good deal and doubtless will suffer more excisions in the future since some of the groups are very distinctive. In spite of this it is a fairly homogeneous collection. The only inroad I should be inclined to make is to withdraw the species which fit into

*Rhodopaxillus* Maire, where the characters are clearly cut—small usually echinulate spores of a colour between reddish fawn and buff, the gills easily separating from the pileus. In this genus are to be found the common *Tricholoma personatum*, *nudum*, *panaeolum* and a few uncommon or rare species.

Another section which may have some claim to generic rank is *Melanoleuca* Pat., which takes in *Tr. melaleucum* and all its satellites. The two features that constitute a claim for separate treatment are the peculiar spear-like cystidia on the gill edge and the amyloid punctate spores which are pure white.

CLITOCYBE Fr. Several of the small groups containing two or three species have been placed in separate genera by modern authors. To mention a few:

*Lepista* W. G. Sm. The common *Cl. flaccida* goes here because of its small rough spores.

*Hygrophoropsis* Schroet. Under this horrid name we find the false chanterelle, *Clitocybe*, or if you prefer the older designation, *Cantharellus aurantiacus*.

Then there are some sections which have been transferred to genera on account of their amyloid spores, and one group goes to *Rhodopaxillus* in spite of having decurrent gills. The rest remain put, including those nasty little things we are always puzzling over, the commonest being *Cl. vibecina*, though you may not find this name in your books, as all the older British authors left it out.

MYCENA Fr.—Few changes have been proposed for this large genus. Some species on the border line between *Omphalia* and *Mycena* may find a resting place in the latter genus. The decurrence of the gills is a helpful feature in deciding under what genus an agaric should be placed, but one may surmise that in some future classifications it will hardly have the same importance as hitherto. The few species with warted amyloid spores have been grouped in the genus *Mycenella* Lange. In the study of *Mycena*, the cystidia are of great importance, a large group having warted or brush-like cells on the gill edge. I expect somebody will soon propose that all these should go into a new genus. It is an interesting fact that all the species with brush-like cystidia also have spores that become dark in colour with iodine.

COLLYBIA Fr.—Several species of *Collybia* have been transferred to *Marasmius*, the limits between these two genera not being too well defined. Some authors also wish to place in a separate genus the many species now in the *Tephrophanae* section, all of which are grey or blackish in colour, but I cannot resign myself to this change. Then there are the two large species with rooting stem, each of which has been given the distinction of separate treatment, the common *Collybia radicata* going into *Mucidula*, having as companion *Armillaria mucida*, which at first sight does not seem to have any affinity with the other, but if you look at the long cystidia and the large subglobose spores, you will understand why they are considered as nearly related. The second rooting *Collybia*, which is the rare *C. longipes*, has also some points in common with *radicata*, but René Maire has seen fit to place it in a group by itself under the epithets *Xerula longipes*.

MARASMIUS Fr.—The small species with horny filiform stem and warted cells on the pileus sometimes go under *Androsaceus* Pat., and there are some other questionable changes.

OMPHALIA Fr.—The small group with shallow vein-like gills of which *O. integrella* is best known, often go into *Delicatula* Fayod and *O. campanella*, which we so rarely see, but when met with may grow in vast numbers, is more like a *Marasmius* in its consistency, and Kühner and Maire have proposed for it the genus *Xeromphalina*.

PLEUROTUS Fr. is split up into six different genera by French authors, some of which only include a solitary European species. Some of the other groups are fairly extensive, especially *Acanthocystis* Fayod based chiefly on the gelatinous layer in the pileus, the commonest species being *Pl. petaloides*, which we often find growing in large quantities on sawdust heaps.

HYGROPHORUS Fr. is often separated into three genera, well known as sectional headings used by Fries himself; I refer to *Limacium*, *Camarophyllus*, and *Hygrocybe*. As the hyphae in the trama of the gills is differently orientated, perhaps this may be justified though it does not appeal to me.

LACTARIUS Fr. and RUSSULA Fr. are fully homogeneous so far as European species are concerned. Some tropical *Lactarii* depart from the type. The study of these two intimately related genera, especially *Russula*, has been elaborated in recent years by minute observations on the spores, which, when examined in iodine under a high magnification with oil immersion, are found to have various kinds of ornamentation of real value in diagnosis. I fear however that there is a tendency to split some groups into species based on characters that have still to be proved constant and which has called forth discussion as acrid as many of the species themselves.

So much for the *Leucosporae*, some of the spores of which are termed white more by courtesy than fact.

When we come to the more definitely coloured spore groups we may find the taxonomy more difficult, because there are many more species not yet described with sufficient clarity to recognise.

Among the pink-spored fungi, the modern experts go back to Quélet in lumping all the species with angular spores under

RHODOPHYLLUS, including *Entoloma*, *Leptonia*, *Nolanea*, *Claudopus* and *Eccilia*, which most of us still find very useful, though certainly not very distinctive genera, the French author Romagnesi has built up an elaborate taxonomic structure based on the geometrical pattern of the spore. It is a complicated scheme which may be found more practicable when simplified.

The other pink-spored genera call for no comment.

Coming to the *Ochrosporae*, some of the familiar genera must undergo considerable revision, whilst others remain as they are.

*Pholiota*, with its well-formed membranous ring on the stem, calls for considerable changes. Among the more robust and fleshy species those with a faint gauze-like veil, closely adnate to the pileus, have been separated. *Ph. caperata* goes into *Rozites* Karst. and Maire has proposed *Phaeolepiota* for *Ph. aurea*. Then the more common *Ph. radicata* is really a *Hebeloma* with a ring, and the still more common *Ph. praecox* with a few others find an appropriate niche in the genus *Agrocybe* Fayod. There are also several slender species like *Ph. togularis*, which in their substance and anatomical features are so like *Galera* that they should either go into this genus or be transferred to a separate one, *Pholiotina*.

GALERA itself has two sharply-divided sections, one including species which have the surface of the cap made up of globose cells and usually possess skittle-shaped capitate cystidia on the gills; the other section has long narrow hyphae in the cap tissue and long non-capitate cystidia on the gill edge. These sections may be converted into the genera *Conocybe* and *Galerina*. All is not so clear-cut as this might suggest, but that is what usually happens. The agarics had little concern for the poor efforts of man to classify them when, in the course of ages, they chose to grow and develop in their own sweet way.

HEBELOMA Fr. has not been subjected to any cuts. FLAMMULA is in process of division, the species with deeply-coloured spores and a special type of cystidia being placed in a new genus, *Fulvidula* Romagnesi.

NAUCORIA Fr. is a varied collection which must be divided up and some of the groups have already found their rightful position. *N. escharoides* and its satellites, most of which grow in wet places, are well grouped in *Ahnicola* Kühner. Then there is *N. Cucumis* with its remarkable pointed cystidia on the gill edge, appropriately rechristened by Heim as *Macrocystis Cucumis*. For the series of *Naucorias*, with a rooting stem and rough spores, Heim has also found a new name, *Phaeocollybia*. Some of the *Naucorias* have been transferred to *Galera*, and so on—eventually there will be few left with the old generic name.

At present we have a very varied collection of species under PAXILLUS, but not more than two or three can be described as genuine Paxilli. The white-spored ones are best in *Clitocybe* and some in new genera that have been proposed, especially those with amyloid spores like *Paxillus giganteus*. One species is best placed among the *Boleti*.

INOCYBE Fr. will probably remain intact, and Schröter's genus, *Astrosporina*, for the species with nodulose spores, though adopted by Rea, does not find acceptance elsewhere.

After all this slaughter we might expect the largest of the ochre-spored genera CORTINARIUS to be split up beyond recognition; but that is not so—or perhaps those inclined to revolutionary changes have not yet set to work on this very difficult group. Ricken used the six Friesian sections as separate genera, but nobody else seems to want to. The fact is that the sections run into each other in such a way that there seems no justification for dismemberment, though, indeed, the extremes do seem to be very different. The robust species of the Scauri group in the *Phlegmacium* section do not appear to have much affinity with the slender species of the *Telamonia* and *Hydrocybe* group. For the present, anyway, the old genus holds good.

Lastly we have to consider the groups with dark-brownish or purplish-black spores, where much the same story has to be told as in the ochre-spored series.

STROPHARIA Fr. has several well-marked sections which must finally be withdrawn, especially those which are closely related to *Hypholoma*, and

HYPHOLOMA itself has three clear cut divisions. First there are the agarics like *H. fasciculare* which have for some years found a suitable genus in *Nematoloma* Karst. It is also quite obvious that what is usually called *Hypholoma velutinum* is distinct from any other member of the genus. Patouillard found an excellent epithet for it, *Lacrimaria velutina*. The rest fall into the genus *Drosophila* Quél., though one of these groups must remain in *Hypholoma* as it is a rule of nomenclature that when a genus is split up the old name must remain for one of the sections. This rule is sometimes very awkward in practice.

PSILOCYBE presents much the same problems where some species might well go in *Nematoloma* since they are clearly related to agarics like *Hypholoma fasciculare*. Some would also go into *Drosophila* and the small things like the common *Psilocybe physaloides* would be well placed in *Deconica* W. G. Smith. The fragile blackish-spored agarics which we call *Psathyra* and *Psathyrella* can be lumped together under one or other of these epithets, though some will find their way into *Drosophila*.

The mushrooms are hardly likely to be split up, though there is still much work to be done before we know the species well. They are usually placed in the genus *Psalliota*, which was the epithet used by Fries as a sub-genus of *Agaricus*. As I mentioned before there is a rule that when a genus is disintegrated into several genera, the original name must be retained for one of the genera. Massee used *Agaricus* for the mushrooms and the French authors have followed suit, but most of us still prefer *Psalliota*.

Finally there is *COPRINUS* which is also a clear-cut group which is not likely to be disturbed unless somebody thinks it worth while to separate *Coprinus plicatilis* from the rest since, unlike other species, the gills only deliquesce, the pileus not taking part in the autodigestive process. Many species have been added to *Coprinus* in recent years.

You will understand that I have treated the subject in a somewhat cursory manner in order to give you a rough idea of the changes which are bound to come once we start on a new classification of the agarics. As already indicated I prefer a transitional phase in which these changes are only shewn as sectional headings, while in the meantime you have, so far as possible, the best of both worlds—the old Friesian groups combined with the alterations which the new methods of diagnosis may render necessary. Even if we accept all the changes proposed by those who are dead set on what many will think are undue multiplication of genera, even then we should not reach finality. Science marches on and systematic mycology, a lowly but necessary hand-maid of science, will be the subject of progressive study for many years to come. New methods of diagnosis will be discussed, new problems of taxonomy contrived to puzzle us. There is no reason why this should prevent our finding out new and simpler methods of study which will attract new students to our ranks.

The beauty of the fungi, whether seen with the naked eye or with a pocket-lens, or under the ever-increasing magnification of the microscope, will continue to give us pleasure, I hope. They will still make us ponder at the marvels and the complexities of living matter. Mycology is no dry-as-dust study. It takes us into the woods and fields. It may even give a certain zest of adventure and refreshment to the jaded spirits of the modern world. Like old Elias Fries we may find in the study of these curious organisms a perennial fountain of delight and in spite of materialistic philosophies which would take away all the beauty and the purpose of life, we may still wonder at the wisdom which rules the universe.

**Ricciocarpus natans L.**—This aquatic hepatic grows in a broad ditch on the west side of the New Junction Canal at Kirkhouse Green. It is in fair quantity, but its numbers are kept down by ducks. It also grows abundantly in some ponds on the towing path side of the Sheffield and South Yorkshire Canal between Thorne and Stainforth.—J. M. TAYLOR.

**Fossombronina Wondraczeki (Corda) Dum., an Hepatic new to V.C. 64.** On a recent visit to the Leeds area Mr. E. C. Wallace found this liverwort rather sparingly in a stubble field near Thorner.—H. WALSH.



## SWIFTS AT MASHAM, 1946

RALPH CHISLETT

THE Swift (*Apus a. apus*) is numerous and conspicuous ; and yet is a surprisingly difficult bird to watch purposefully, even in the breeding season, out of which little seems to be known of it. We had three pairs under our roof this year, the entrance holes being merely spaces between stonework from which plaster had fallen. It was impossible to inspect the nests, or the cavities that contained them, from inside or out.

On April 30th two birds were flying high above the low ground near to the river—it was the first time I have seen Swifts in that month. E. Holmes was with me. The birds disappeared and Swifts were not seen again until May 4th, when for a short time five circled and screamed above the house. By the 9th, the species was more in evidence ; and on the 10th some ten pairs were inspecting parts of various roofs. On the 13th, two birds began to use a crack below the eave above my study window, which we soon began to call 'Nest No. 1.' Two or three days later birds began to use two holes below our northward facing eaves, some three yards apart.

During the next three months I made notes of any behaviour that might give evidence of proceedings behind the stone facade. At first, and during June, birds were seldom seen except in mornings and evenings. On July 7th, weak sounds as of young birds being fed began to be audible from hole No. 1, after a bird had entered. These notes were much weaker than and easily distinguishable from the ordinary calls of adults often made from the holes when screaming parties flew past. At this time Swifts began to pay visits at mid-day (12-20, 12-54, 1-23 on July 7th), leaving again in one minute or less. Times given are B.S.T. except where definitely stated in relation to sunset. Feeding times were early morning, again between 9 and 10 a.m., around mid-day, late afternoon, and evening ; more than one visit being paid by each bird, usually at each feeding-time, after which they would generally disappear completely after a few circles round overhead.

Sometimes birds curved down to their holes with a mighty swish through the air ; but also often entered silently ; at other times the sound of contact of feathers and feet with stone could be heard. Feather sounds were also made in the air occasionally, as when a bird swerved to avoid a wire ; and at other times when one wondered if the twist of wing that produced the sound was deliberate for purpose of a signal.

The violent thunderstorm of July 13th, which brought the temperature down by some 20 degrees, and the colder spell that followed, lasting until July 19th, affected the birds' behaviour. Swifts ceased to skate across the local sky, flying directly away out of sight after feeding the young, and remaining away for most of the day. During this period I saw Swifts hawking over the high moors some 5 or 6 miles away. Visits to feed young became fewer, so that in some days birds were not seen between 9 a.m. and evening, except for the maintenance of the mid-day visits. At night they came in to roost some 45 to 50 minutes after sunset, varying a little with the brightness or dullness of the evening, being inside earlier on cloudy nights. They usually went in and left again two or three times before finally staying.

Local hunting was resumed on the evening of July 19th, and continued with warmer weather. But not until July 26th could we count up to 16 birds in a party again, as we had done before dusk on July 12th. Thereafter party numbers increased up to 25 on August 4th, when no doubt some young birds were included, although old and young could not be distinguished in the air.

On August 3rd a young Swift was caught on a window-sill and ringed. It was well fed and fully feathered with white throat and pale edges to feathers in the wings and on the forehead. It made no attempt to fly until tossed from an upper window, when it swooped down for a few yards and flattened out across a pasture and away.

No squeals or calls came from Nest No. 1 after August 4th ; nor did any birds come in at night. Thereafter numbers of Swifts visible began to decrease ; and from August 9th, the largest number seen together was 14 in the evening of the 12th. The party was built up gradually during the course of half an hour. None

had been seen between 9-15 a.m. and 8-30 p.m., although I watched whilst gardening most of the day. Four birds were seen to enter our two adjacent holes at 9-7 p.m., where they stayed.

Calls of young could only be heard now from one hole, but both holes continued to be used for roosting purposes—about 45 minutes after the now earlier sunset. Departure from holes in the morning was usually *after* sunrise by as much as an hour. On August 16th, two birds left hole No. 3 together at 7-18 a.m., with sunrise (after allowing for the hour) at 5-45. None were seen all that day until eight turned up at 8-30 p.m., circling and screaming in a clear sky. At 8-50 a bird entered and stayed in hole No. 2; and at 8-54 two birds entered hole No. 3.

On the following day no Swifts were seen; they had gone before we arose, and none came in at night. This day of final departure of the latest Swifts in Masham was fine and sunny, with a slight N.E. wind—southern England had heavy rain with floods and a strong N.E. gale.

Summarised, my notes show that the Swifts in one small restricted area arrive independently. Weather conditions may affect their behaviour, and when insects are scarce Swifts fly elsewhere for food; and the young may have to manage with fewer meals. The nightly times for retirement also vary with weather conditions. Although Swifts hunted for food until evening dusk (when bats were sometimes about), they remained in their holes during the first hour or longer of daylight, during their last few days here. Early morning activities were not watched often enough to see if they varied much with the weather; but quite possibly they did. The young remain in the nests until able to fly; and the family may be away all day and return to the hole to roost for a night or two until they decide it is propitious for departure. The families depart independently, each in its own time.

## APLOZIA CAESPITICIA (Lindenb.) Dum. IN YORKSHIRE.

H. WALSH.

IN the Moss Exchange Club Report for 1922, there is a record for this rare Hepatic from Delph, V.C. 63. This record was unfortunately omitted from the list of Yorkshire Hepatics in the *Transactions of The Yorkshire Naturalists' Union*, Part 37, 1946, and should be included in any future list. During 1946 I collected this species in five different localities in the Halifax area.

Above Lumbutts village, near Todmorden. On a bank near a stream, it was found in small amount slightly intermixed with *Calypogeia fissa* and *Cephalozia bicuspidata* growing on a recently exposed clay surface. This was submitted to Dr. W. Watson who confirmed the identification.

Above Lumb Falls in Crimsworth Dean, near Hebden Bridge. Here the plants occurred in small, isolated patches and also intermixed with *Calypogeia trichomanes*, *Diplophyllum albicans* and *Cephalozia bicuspidata*.

In Jumble Hole Valley, near Hebden Bridge, in small isolated patches on a recently exposed clay surface, gemmae were present in October.

Near Mytholmroyd, on an outlier of Errington Moor. Here the moor mingles with cultivated pasture and a clay subsoil comes to the surface. There was more of the hepatic here than in any of the other localities, but the plants were confined to a small area, below the pasture grasses covered the surface, and above the peaty surface of the moor with heather, etc. There were small, isolated patches on the clay, but more frequently it grew intermixed with *Alicularia scalaris*, *Cephalozia bicuspidata*, *Gymnocolea inflata* and *Calypogeia trichomanes*. A few perianthes were present in September.

Again near Mytholmroyd, in Broadhead Clough, on the edge of Spring Wood, on a recently exposed clay surface, gemmae were present in October.

Excluding the Delph record, there appear to be only three other British records, viz. Isle of Wight, Surrey and Gloucestershire. In the field it can be mistaken for small plants of the common Hepatics, *Alicularia scalaris* and *Aplozia crenulata* and it may be more widespread than the records suggest. The wet summer of 1946 has undoubtedly favoured the plant for a striking feature was the small colonies of young plants on bare clay surfaces.

## OBSERVATIONS ON A PAIR OF NUTHATCHES IN 1946

R. M. GARNETT

THE nuthatch (*Sitta europaea affinis*) is not a common bird in N. E. Yorkshire, but has for many years bred sparingly in parks and woodlands in Ryedale, and has in recent years extended its range across the moors to Eskdale. It was first noticed at Thornton Dale in the autumn of 1945, when a pair was seen by Mr. C. Green, taking hazel nuts in a private garden. This pair remained throughout the winter and bred successfully this spring. Some notes on their activities are given below.

From early February the birds were frequently seen in private grounds and the adjoining park-like fields, and by March 25th the male had found a suitable nesting-place, which he was seen, on that date, shewing to his mate by frequent visits to the hole, though she displayed no interest until March 30th.

The site chosen was a natural hole about fifteen feet up in the bole of a sycamore in full view of a busy main road, but on private land and between two branches of a beck. The hole was oval in shape and the birds could just squeeze in by turning on their side. No mud was therefore necessary and none was, in fact, used. Debris from the hole was removed by both birds, the male working on March 26th-29th, and the female on several dates between March 30th and April 6th. Both birds were seen hacking at the rim of the hole on many occasions, though the wood was very hard, and so far as could be seen, no impression was made. Building had begun by April 9th and was entirely the work of the hen, the cock being in attendance, and the only material seen to be taken in was bark from a syringa bush stem, some thirty yards from the nest. Some of these strips of bark were as long as the birds and were got in with difficulty. Building was completed by April 12th.

On April 17th the hen remained some time on the nest and it was thought that she had then begun to lay, and that she had begun to brood by April 30th. By the behaviour of the birds it was obvious that the young were hatched or hatching on May 16th, and the normal incubation period would make this probable. The first time a young bird was seen at the entrance was on June 2nd and they left the nest on the evening of June 7th, which was sunny and warm. One was seen to fly straight from the hole into some tall trees about twenty yards away, but the number of eggs laid and young reared was never ascertained.

The hazel nuts having been exhausted in the autumn, yew berries, which were very numerous, probably provided them with food; and it was thought that small round objects often seen in their bills were the hard seeds left on the ground, perhaps ejected by the many thrushes which swallowed the berries whole during the winter. The warm weather in mid-March brought out some insects, and on the 23rd the male was seen taking some of these which had hatched from the stream and were resting on the trees close by. On March 26th both birds were hawking insects over the water. The cock was first seen to feed the hen on April 20th, during her laying period, collecting winged insects believed to be ephemeridae, which she greeted with shivering wings. She placed them in a crevice before eating them and between feeds sat quite still, sometimes closing her eyes.

During the late winter, cheese-rind had been placed in suitable cracks where the birds were seen, and these disappeared. Later, when the nest had been chosen, a supply was provided on the bole of an adjacent tree and the birds soon learned to associate my visits with this food. The cock took it the more readily, and breaking up the pieces, distributed them in suitable crevices, where, no doubt, both birds would find them. Sometimes he pushed in a piece of bark over the cheese as though to hide it. It was noticed that when breaking up the rind, both birds used their wings with a very rapid flickering motion to add strength to the blows. During the incubation period the cock fed his mate both on and off the nest. When the young were first hatched, the cock brought food which the hen took while in the hole and presumably passed to the young. When he found her off he went in himself. As the young grew older they were fed with cheese rind by both birds; the first time this was seen was on May 22nd, when they would be about a week old. Winged insects and green caterpillars were the natural food brought. The adults became tamer each day and would come down for rind almost to my feet, but the hen was the shyer of the two, probably because



her mate fed her. On May 28th he took the cheese from my finger, and by the time the young left the nest he readily perched on my knee. Even when the whole party had moved off he came down as usual at a new place a hundred yards or so away. He paid no attention to a camera six feet away, and was photographed both on my knee and on the bole of a tree close by, on the day the young left the nest.

The cock was surprisingly silent and only sang for a short period from March 25th, when the nest was chosen, until mid-April. His notes sounded like "Chew, chew, chew" and "Tu-ee, tu-ee, tu-ee." A trilling call was used when a cat passed below the birds and when chasing other species, starling, great tit, and house-sparrow, away from the nest hole both sexes used this note. On three occasions when the hen was in the nest he used his kestrel-like call, "ki-ki-ki-ki" though nothing was seen at the time to cause any excitement. When coming for cheese-rind both birds used a soft tit-like call, "tsit tsit," which was also used by the hen when she was expecting food from her mate. Once, when coming to my knee, the cock used a single plaintive note "pew." The young "chittered" in the nest from May 25th, before they began appearing at the entrance.

Nothing was seen of display flights and only once on April 20th, was any kind of posturing seen. On that occasion the cock, on a horizontal bough of an elm, was turning slowly this way and that, and once in a complete circle, with neck stretched and lowered head, and looking upwards to the tree top, where it was assumed his mate was. His tail was not spread to show the pattern.

The cock could be distinguished from the hen by the brighter fringes of his chestnut flank, which he fluffed out over the edge of the closed wing. The hen showed a patch, too, but it was usually hidden beneath the wing. She kept a trim appearance throughout, but the cock became more and more dishevelled. The young resembled the hen but were paler and shewed only a touch of chestnut far back on the flank.

Droppings were carried away by both parents by May 23rd, when the young were about a week old and right up to the date of their leaving the nest. On two occasions one of the young was seen to defaecate to the parent waiting at the entrance to remove the dropping.

### THE YORKSHIRE NATURALISTS' TRUST LIMITED

NATURALISTS will be pleased to hear of the formation of a Trust, having for its objects the establishment and maintenance of sanctuaries for the conservation of Wild Life in Yorkshire. The recent acquisition of Askham Bog has given great satisfaction to all northern naturalists and it is hoped that other areas of biological interest may be secured for preservation and protection by the Trust.

The Union has associated itself with other learned Societies and Educational Bodies in according official support to the Trust. Readers who have not seen the original memorandum are invited to write to the Honorary Secretary, the Yorkshire Naturalists' Trust, Limited, The Yorkshire Museum, York. Applicants will receive an informative brochure giving an illustrated account of its first acquisition and setting forth its detailed aims.

The success of this enterprise depends upon the widespread support which it receives in its valuable work and we strongly urge all our readers to become members of the Trust. The membership fees are, a sum of not less than £10 for Life Members, or an annual subscription of not less than 10/- for Ordinary Members.

### YORKSHIRE CONCHOLOGICAL SOCIETY

On the 28th September, 1946, this Society held a *conversazione* to celebrate its Jubilee. The President, the oldest living member, Mr. J. Digby Firth, occupied the chair and gave a warm welcome to Dr. J. Wilfrid Jackson (until last year Hon. Secretary of the Conchological Society of Great Britain and Ireland and a Past President of the Y.N.U.) and to delegates from kindred Societies at Bradford, Doncaster, Halifax, Leeds and York.

Dr. Jackson gave a most interesting address on 'Yorkshire Conchology and its Founders,' recalling such stalwarts as J. W. Taylor, W. Denison Roebuck, W. Nelson, H. Crowther and a host of others.

Inspection of a wide range of exhibits brought by members and visitors, and light refreshments, brought to a close a most enjoyable function.



## THE EFFECTS OF SOME INSECT PARASITES UPON SPECIES OF MELANDRIUM.\*

H. G. BAKER, PH.D.

A FULL list of the animal parasites of *Melandrium dioicum* (L. emend.) Coss. and Germ., the Red Campion, and *M. album* (Mill.) Garcke, the White Campion, will be given elsewhere. This account concerns the ecological effects of three kinds of parasite upon these species.

### *Contarinia steini* Karsch.

The flower buds of both species are visited by females of this Cecidomyid, which lays eggs within the buds. The eggs develop into white larvae which cause malformation of the developing flowers. These never open and, in consequence, are sterilized. In staminate plants the petals and filaments of the stamens become fleshy and do not elongate, causing the bud to swell and become spherical and firm. Eventually, the bud reaches a diameter of about 7 or 8 mm. The anthers contain good pollen, but they do not dehisce. Usually, there are 6 to 8 larvae which develop an orange colour, in a fully swollen bud, those containing fewer larvae are less swollen and may open slightly. The flowers do not fall after the usual period, but persist, becoming withered and brown. Before this happens the insects have left.

With pistillate flowers a similar course is followed, the styles failing to elongate.

The infestation is chiefly upon staminate plants and, therefore, has an upsetting effect upon the sex-ratio. It is widespread and has been observed particularly with *M. dioicum*. There does not appear to be any difference in strain between those individuals attacking the two species of campion, the transfer of individuals from a flower-bud of *M. dioicum* to a young bud of *M. album* causing malformation in the latter.

The gregariousness of *M. dioicum* is of particular advantage to the parasite, and often infestations are severe. Despite this, insufficient pollination of pistillate plants has not been observed in any naturally-occurring population as a result of *Contarinia* infestation.

Harrison (1942) reported upon an infestation of the white-petalled variety of *M. dioicum* (*M. d.* var. *albiflorum*) which he observed in the Team Valley, North Durham. In June, 1942, this plant bore perfect, white-petalled flowers; in July the plant was visited again and was seen to be heavily infested with larvae. Some of the flowers had managed to open as they carried only a few larvae. The petals of these flowers were pink. In a discussion of the possible method of pigmentation he ascribes to the larvae the secretion either of an enzyme, which acted upon the chromogen or of an activator which caused an enzyme already present to act upon the chromogen.

Results obtained by the present author conflict with these. Among the plants of this variety growing at Halliford Manor, Middlesex, one pistillate plant agreed with the others, except for a salmon-pink coloration of the petals (although there was no vegetative anthocyanin). This suggested a spontaneous reversion from the white-petalled condition. Subsequently, Mr. C. R. B. Williamson observed another plant with pink petals amongst a collection of plants all of which had been thought to have white petals.

Another pistillate plant of this variety produced only white-petalled flowers when growing in nature, but was damaged during transfer to the greenhouse. Subsequently, flowers were produced with pink-petals. This change cannot be called "spontaneous" but no chemical substances were received from any other organism.

The reverse change was observed this season with a plant of *M. dioicum* var. *Zetlandicum* Compt., growing in an experimental plot at Weetwood, Leeds. Pink petals were produced during the early part of the summer when the weather was generally wet and cool, and more nearly white petals were produced later in drier weather. In July, 1944, a plant of *M. dioicum* var. *albiflorum*, which was heavily infested with larvae of *Contarinia steini* was encountered near Weybridge, Surrey. All its petals were white. The same phenomenon has been observed more recently

\* The substance of this article is abstracted from a thesis approved by the University of London for the degree of Ph.D. (Baker, 1945).

(July, 1946) at Colton, near Leeds. Plants of *M. album* which have been seen to be attacked showed no change of petal colour, also.

Larvae were collected from flower-buds of plants of *M. dioicum* and introduced into unopened flowers of *M. dioicum* var. *albiflorum* and *M. album*. In neither case was the colour of the petals altered, although malformations developed in some cases.

It is worthy of notice that the flowers which Harrison reported as bearing pink petals were the ones which contained fewest larvae and, thus, had suffered the least. It is very seldom that *all* of the flowers on a plant are infested and it would be interesting to know if any of the flowers on this plant were free of larvae and, if so, what was the colour of their petals.

It is suggested that there is no evidence that excretion from *Contarinia steini* can cause the development of pigment in white petals in these species.

*Harmodia capsincola* (Hb.) (*Dianthoecia*).

This is one of the night-flying moths which pollinate *M. album*. Also, it is more directly parasitic upon both of the species and particularly upon hybrids between them. The eggs are deposited in the developing flowers and the resulting larvae eat their way into the apices of the young ovaries and consume the developing seeds. It is usual for only one larva to be found in each flower. While there is still room the larvae remain within the developing capsule, excreta being extruded through a hole in the wall. Eventually, the larva becomes too large for the capsule and may migrate to another flower. It descends to the shelter of the soil during daylight, returning at night. Finally, the larva pupates in the soil, where overwintering of the pupa takes place, also.

Larvae were seen eating through the calyces of pistillate flowers to reach the ovaries. Staminate flowers were not attacked, although the balloon-shaped calyces of pistillate flowers which had become "staminate" because of infection with *Ustilago violacea* were bitten through and the rudimentary ovaries attacked.

Infestation by the larvae of *Harmodia* is followed by the use of the empty capsules as shelter by earwigs, lady-birds and spiders. Earwigs, in particular, are very common.

There appears to be a correlation between the formation of two broods of larvae and the two periods of flowering of the champions.

The connection between the parasitic and pollinating actions of these moths is interesting and there is a possibility that the former led to the latter for *M. dioicum*, which is more primitive, probably, is parasitised but not often pollinated by these moths. Furthermore, the moths are the vectors of the disease caused by the fungus *Ustilago violacea* (Pers.) Fuckel as they carry the spores between the flowers.

Several other moth-larvae feed upon the developing seeds, although less frequently. Among these are *Harmodia cucubali* Friessl. and *H. nana* (Rott.) Eupi. The attacks of the larvae of all these species upon the leaves of the champions are not serious ecologically.

*Brachycaudus* (*Anuraphis*) *lychnidis* (L.)

Aphids are characteristic parasites of both species, their prevalence upon *M. dioicum* being responsible for its popular name "Lousy Soldier's Buttons" in some parts of this country. According to Dr. O. W. Richards, the species responsible is *Brachycaudus* (*Anuraphis*) *lychnidis* which is green to brown in the young stages and deep brown to black when adult.

Adams (1931) states that the glandular hairs upon the flower-stalks and adjacent structures of *M. dioicum* "may have the function of excluding useless honey-sucking, crawling insects." Nevertheless, even with *M. album*, where they are more frequent, they do not provide protection against the aphids, who cluster most frequently in the region of the flowers. Although the attacks of these aphids must weaken the plants their effects are not sufficient to be obvious.

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## PILMOOR

CATHERINE M. ROB, F.L.S.

In Baker's *Flora of North Yorkshire*, the name Pilmoor occurs many times, but it looks as if this well known botanical locality will soon cease to exist as such. This area of wet moorland near the junction of the Harrogate line with the main L.N.E.R. line, is the last remaining area of its kind in the low country around Thirsk, and several visits each year from 1924 to 1939 have shown that a gradual drying up is taking place.

When first I started to visit Pilmoor regularly it was hardly possible to cross parts of the moor even in thigh boots, except in a dry season, but by 1939 it was an easy matter and even the wettest parts could be crossed in ordinary rubber boots. Most of the smaller ponds were, by this time, mere depressions in the ground where water stood in winter, but which were dry for most of the summer, and by 1945 some of these depressions were almost filled up. In 1924 there was a fair amount of Birch fringing the wetter parts of the moor, with patches of *Calluna* on the dry areas; by 1939 the Birch had more than doubled in quantity, and was encroaching rapidly on the *Calluna*, and in 1945 the small bushes of Birch on the *Calluna* area had grown quite large and there were many seedling plants to be seen.

Near the railway siding which runs through the moor there was, even in 1939, a fair sized patch of very wet ground, with *Radiola Linoides*, *Anagallis tenella*, *Drosera rotundifolia*, *Baldellia ranunculoides*, and *Pinguicula vulgaris*, and up to 1935 *Pilularia globulifera* was to be found in the wettest part. Last year a rather hurried search failed to show either the *Drosera* or the *Radiola* and the other plants were in very small amounts; where *Pilularia* once grew was a large bed of *Mentha sativa*, and a great part of the ground was scrub Birch and *Molinia*.

This general drying up of the moor seems to have been going on steadily for many years. Baker records *Lycopodium inundatum*, *Drosera longifolia* and *Peplis Portula*, none of which I have been able to find. The *Lycopodium* was still to be found in 1898, when the late Wm. Foggitt of Thirsk saw it, also *Utricularia minor*, *Cirsium dissectum*, *Stellaria glauca* and *Peplis*. Mr. Foggitt notes the *Cirsium* as recently as 1914 but adds that the plant failed to flower that year. Repeated searches for these plants have all been unsuccessful.

At one time *Osmunda* was frequent upon the moor, but the disappearance of this plant is the fault of the fern hunter and not the changing condition of the area. In 1888 there were two fine roots of *Osmunda* (the last two?), which had been dug up on the moor, in one of the gardens nearby. Both *Hypericum elodes* and *Gentiana Pneumonanthe* were abundant at one time, but in 1945 I saw very little of the *Hypericum* and only four plants of the *Gentiana*. *Potamogeton gramineus*, *Sparganium minimum* and *Utricularia vulgaris* grew in the largest pond in 1930; nine years later the bottom of the pond was a matted tangle of moss and all trace of the *Potamogeton* and *Utricularia* had gone, while the small amount of *Sparganium* still remaining looked in a poor way.

From 1939 to 1945 I was unable to visit the moor and some of it was used as an ammunition dump, which curtailed the visit in 1945. It was only possible to get on to the part near the railway siding, so what has happened to the *Sparganium* was not noted. The area visited showed a very marked increase in Birch and a decrease in the amount of standing water.

Some rare plants are still to be found on the moor, *Calamagrostis epigeios* is increasing and has spread to the north side of Helperby road, and there is a fair quantity of *Deschampsia setacea* in several of the dried up ponds. *Agrimonia odorata* is more abundant than in 1939, but the general effect of the dryer conditions prevailing on the moor is the disappearance of the water-loving plants. There appears to have been no drainage of the actual moor during the last 20 years and it seems unlikely the improved draining of the surrounding farm lands would in any way affect the moor. There are two deep ditches along the Harrogate branch line and these may have speeded the drying up of the parts of the moor nearby, but they can have in no way contributed to the general drying up of the whole area, which seems to be entirely due to natural changes. During the last ten years the rate of drying up has been very much greater than in the ten preceeding ones, and at its present speed it looks as if another ten will see the end of all the standing water on the moor, which will become a thicket of Birch, and Pilmoor, as a botanist's haunt, will have lost most of its former interest.



## A NOTE ON CERTAIN COLEOPTERA TAKEN AT ASKHAM BOG, ETC., AND NEAR MIRFIELD

THE REV. E. J. PEARCE, M.A., F.R.E.S.

I AM very glad that a recent note by Mr. W. D. Hincks on 'Rare Coleoptera at Askham Bog, Yorks.' (*Ent. Mon. Mag.*, 1946, 185), can so justifiably strike an optimistic note as to the continued coleopterous richness of this famous locality. My own (necessarily somewhat infrequent) collecting visits in recent years in search (in particular) of Halipidae, Pselaphidae and Scydmaenidae have not been very successful, and I admit the temptation to join chorus with those who have cried 'ichabod' in regard to Askham Bog.

With regard to the Halipidae, I have so far only taken five species there, viz., *Haliphus confinis* St., *immaculatus* Gerh., *lineolatus* Mann., *ruficollis* Deg., and *lineatocollis* Marsh. But I have rarely been there at the best time for water-beetles. Given favourable conditions and opportunity for several visits in the spring, this list should be added to considerably. In the case of the Pselaphidae one would expect a long list considering how many ideal habitats for them the bog should provide. But very careful search on about six visits at various times of the year has not come up to my expectations, and I have only seven species to record, viz., *Biblopectus pusillus* Denny (far from common), *Brachygluta fossulata* Reich., *Bryaxis* (*Bythinus*) *puncticollis* Denny, *bulbifera* Reich., *burrellii* Denny (distinctly rare), *Tychus niger* Payk., and *Pselaphus heisei* Herbst. This is a meagre list for such a locality allowing for the fact that I have not worked specially for the *Euplectina*. I have failed so far to find *Ps. dresdensis* Hbst., certainly it never occurred commonly in the past. But neither in my experience is *heisei* nearly so common as one would expect. *Reichenbachia impressa* Pz. is another former record, but this I failed to find as also the far more ubiquitous *juncorum* Leach. Of course one has to remember that many of these little beetles can be extraordinarily limited in their occurrence in any particular locality. Time and time again one notices that maybe only a few handfulls of moss out of many apparently suitable samples over a wide area will produce satisfactory results, so that diligent search over a wide expanse is often necessary to form a really representative list of all the species occurring within any given locality. Fortunately, Askham Bog is still considerable in its extent, and future search may add to this list, which is certainly disappointing.

While I am on the subject of V.C. 64 it is interesting to note that in 1937 I took *Haliphus laminatus* Schal. not uncommonly in a drainage dyke near Cawood, west of Bishop's Wood. I have taken it in Lincs. S. (but not N.) and in Stafford, in addition, of course, to many places in the southern counties.

In conclusion I may mention that I took *Bryaxis* (*Bythinus*) *burrellii* Denny not uncommonly in a very limited area on the Kirklees Estate, near Mirfield, last March, and again last July. It was pleasing to find this rarer species surviving in such an industrial area as this portion of the West Riding. (V.C. 63.)

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**White-fronted Goose near Keighley.**—On March 26th, from a small pool in a moss in Cowling Parish, at an altitude of 900 feet, I flushed three geese which eventually settled near to a wall bounding a half-mile-distant field. The wall enabled me to approach within 25 yards of the birds and to observe them in detail through a hole. From the white patch at the bases of bills, and from the dark barrings on the breasts, the birds were clearly *Ausen albifrons albifrons*. The breast-bars were more extensive than in any illustration I have seen. The bills were as orange as the legs, differing somewhat from the illustration in *The Handbook*. All the birds were in beautiful condition, and kept to a small area of some 4 yards square of short grass on which they grazed for an hour, after which they squatted and preened, facing into the wind, and there I left them. Notes were pitched differently from those generally made by 'grey geese,' and wing action was much more rapid. Movements had all been initiated by the same bird.

On the following morning the White-fronts were standing by the pool from which I had first flushed them, and in half an hour they took wing westward in the direction of Morcambe Bay.—T. SMITH.



## THE YORKSHIRE NATURALISTS' UNION EIGHTY-FIFTH ANNUAL REPORT

(Presented at Doncaster on Saturday, December 7th, 1946)

**The Eighty-fourth Annual Meeting** was held in the Literary and Philosophical Rooms, Halifax, by the kind invitation of the Halifax Scientific Society, on December 1st, 1945. The Annual Report for 1945 was presented there and is printed in *The Naturalist*, 1946, pp. 21-44.

**The Presidential Address** on 'An Entomological By-path' was given by W. D. Hincks, M.P.S., F.R.E.S. This is printed in the January, 1946, issue of *The Naturalist*.

**The Presidency** for 1947 has been offered to and accepted by Prof. W. G. Fearnside, M.A., F.R.S., F.G.S., M.Inst.M.E., Sheffield.

**The Excursions** for 1947 will be held at :

- V.C. 61. North Cave—June 21st.
- V.C. 62. Slingsby—July 5th.
- V.C. 63. Lindrick Common—June 7th.
- V.C. 64. Burton Leonard—July 19th.
- V.C. 65. Scotch Corner—Whitsun, May 24th-26th.

**The Union's Activities in 1946** were in some measure held up by the weather conditions during what should have been the summer season, but the attendance at the field meetings was good taking this into consideration.

The Mycological Committee held a spring meeting at Thornton Dale for the study of micro-fungi, and in September they welcomed the British Mycological Society to Sandsend on the occasion of this Society's Jubilee.

The Vertebrate Section has acquired the tenancy of the cottage on Spurn Point, and has erected a trap for ringing and noting the migrant birds, and some good work has been done during the year.

The Union has lost thirteen members through deaths and resignations in the course of the year. Over fifty new members have been elected.

### BOTANY

(Chris. A. Cheetham) : The year 1946 has seen the completion of the task of bringing the botanical knowledge of the county up to date. This was commenced by the publication in 1937 of the *Catalogue of Yorkshire Fungi* (Mason and Grainger), followed by the *Supplement to the Yorkshire Floras* (Cheetham and Sledge) in 1941. The revised accounts and lists of Yorkshire Mosses (Cheetham), Sphagna (Thompson), Liverworts (Milsom), and Lichens (Watson) appeared in the Union's *Transactions* for 1945 and the current year.

A warm spell in early February brought out blooms of Celandine and Coltsfoot, but this gave place to frost and easterly weather which kept the vegetation back ; then from March 21st onwards a drought brought widespread water shortage and there was little growth in the fields. Some rain after May 15th and then some hot fine weather in early June gave the farmers an opportunity to get in a light hay crop, but rain and floods at the end of August spoilt much of the grain harvest.

At Austwick the earliest flowers were Coltsfoot and Celandines (February 18th), but the Purple Saxifrage on Pen-y-ghent was not out until March 22nd. The Oak was in leaf April 25th and the Ash April 30th. May blossom was in flower on May 9th, an early date, and the Mealy Primrose on Sulber, 1,220 ft. O.D., was past its best on May 1st, as was the Mountain Avena at Arncliffe Clouder on May 21st. The dry spell in March and April may be the cause of the absence of Cloudberry on Pen-y-ghent where the plants made very little growth this year. The Ash has produced a good crop of fruit and there is plenty of mast under the Beech trees, but only a few Oak trees are well fruited and the Sycamore is below normal. For the fourth successive year we have a good Hazel-nut crop and there will be plenty of Holly berries for Christmas. Blackberries and Cranberries are plentiful.

Generally speaking, the flower displays were poor and the plants were stunted in growth, but later the summer brought an abnormal growth of vegetation and the fields had an abundance of grass. The Bracken seemed several inches above its normal height and this applies to many species of grass and sedge. This was very noticeable at the Thorne meeting in August.

HUDDERSFIELD DISTRICT (W. E. L. Wattam) : Nature students at any rate will remember the year 1946, for the weather vagaries have indeed taught them to become optimists.

It was not until mid-February that the grip of winter was strongly felt, especially from the 12th to the 24th. Snowfalls were slight, not exceeding 6 in. Extreme frost registered were 24° F. on the 11th, 26° F. on the 13th (stated to have been the lowest in Britain for that date), 21° F. and 22° F. on the 18th and 19th. Fog was also prevalent. From this date it was almost a continuous gale with heavy rainfall, the registered rainfall for the month being 5.91 in.

March 3rd brought 4 in. of snow, and up to March 15th intense night frosts. Milder conditions with much sunshine commenced on the 16th (the sunshine registration for the month being 106 hours, the highest since 1928), continuing to April 3rd. The response of plant life was great, especially the blossoming of Lesser Celandine and Goldilocks. In sheltered places Sycamore was in good leaf and *Petasites hybridus* was in full blossom on the 13th. The temperature dropped on the 20th, a severe ground frost ensuing during the night. Cultivated Apple and Pear, Wild Crab, Wild Cherry, Wild Hyacinth and tuberous Moschatel furnished a good display of bloom. Both Oak and Lime were in leaf on April 22nd. From the 21st to the 30th was a sunless period with searing winds from the east. The month of May had bitter winds from east or north-east, and a period of drought for the first 15 days brought about the initial damage to wild fruit crops and cultivated types. The second half of the month had a rainfall of 2 in. The sunshine record was 153 hours, but the benefit arising was nullified by the searing wind and frequent severe night frosts. Damage to developing foliage was great, especially pronounced in the coniferous plantations at High Hoyland. Seedling trees of Ash in their fifth year were in good leaf at Kingsbridge on May 3rd. By the 13th aged Ash trees were displaying large quantities of immature fruit and foliage. Hawthorn and Horse Chestnut were giving a pleasing blossom display by May 11th. June and July were again disappointing, the weather conditions being variable and the lack of continuous sunny periods being pronounced. Three inches of rain fell on July 6th. The brilliance usually associated with August was entirely absent, rainfall and cold cloudy weather being the prevalent vagaries of the elements. Only on 19 days was there no rainfall; 128 hours of sunshine were registered, 33 occurring on 4 days. The total rainfall was 4½ in. The blossoming of Ling was not in full development until the 24th. It was noted on this date that the Heather Beetle (*Lochmaea suturalis*) was causing damage amongst Ling at Fulstone Brow and at Good Bents, near to Holmfirth. September was wetter than August, the rainfall to the 21st being 5.10 in. The last day of the calendar summer will long be remembered by reason of the rainfall of 2¾ in. (almost the total average for the whole month).

SECONDARY GROWTH.—The secondary growth produced by Oak trees (*Q. sessiliflora* and *Q. pedunculata*) was very conspicuous, averaging 7 to 18 in. Sycamore, Birch, Hazel, Elder, Hawthorn, and, in some places, the Lime produced new growth quite out of the ordinary. I have also noted several Laburnum trees with good secondary growth and blossom. Even on September 20th the Male, Lady, Brake, and Northern Hard Ferns were displaying plenty of new fronds. It was, however, noted that *Dryopteris dilatata* (Sm.) A. Gray and *D. Oreopteris* (Ehrh.) Max. had produced no new fronds. On August 24th Bilberry plants at Fulstone Brow had produced much new secondary growth and blossoms. The frost damage to the main axes of Spruce and Silesian Larch trees in Margary Wood, High Hoyland (previously mentioned) had caused newly formed lateral buds at the apex of branches to produce new foliage.

FLORA DESTRUCTION.—Open cast coal working at Cawthorn has destroyed our only locality for the orchid, *Coeloglossum viride* (L.) Hartm., and also a very old moist pasture where *Orchis Fuchsii* Druce usually gave a picturesque display of bloom. The sole locality in our district for *Listera ovata* (L.) Br., was ploughed

last September (1945), limed, and again reploughed in April, 1946, and is now producing a good crop of Kale.

Classified in their order of merit, the fruit crops would appear to be as follows :

EXCELLENT.—Hawthorn, Elder, Ash, *Quercus cerris*, Lime, Birch, Wild Roses (*R. canina* and *R. arvensis*), Bramble, and cultivated Pears.

MEDIUM.—Sycamore, Beech, Elm, Alder, Horse Chestnut, Mountain Ash, and White Beam, Apples and Wild Crab.

POOR.—Oaks (*Q. sessiliflora*, *Q. pedunculata* and *Q. Ilex*), Holly, Hazel, Wild Cherry, Walnut, Black Crowberry, Bilberry and Cloudberry.

SHIPLEY DISTRICT (A. Malins Smith) : Late March and April were sunny and warm and vegetation responded to such a degree that very early records of flowering and leafing were made. Outstanding amongst these was an Ash tree near my house in full leaf by April 30th. I have never previously seen an Ash in leaf before May in this district. Oaks were in general leaf by April 21st. The earliest Beech were just bursting into leaf on April 23rd, but the first I saw in full leaf was on May 10th and the following day I noticed that leafing was general. Some Elms were in leaf by April 5th, Sycamores on April 6th, and Alders on April 14th.

Some of the early flowering records are Coltsfoot, February 15th ; Dog's Mercury, February 16th ; Celandine, Butterbur, Wood Anemone, and Moschatel on March 23rd. These flowering dates, though early, run generally a little later than in the exceptional spring of 1945. The Bluebell, however, made records this year which I have never known equalled. Flowers were recorded in sheltered places on April 1st by Mr. H. Dibb and on April 5th by Mr. S. Jackson. Nevertheless I did not consider them to be out generally until April 28th. Blackthorn was out on April 8th, Primrose on April 14th, and Garlic and Stitchwort on April 20th. Horse Chestnut began to flower on May 10th, and on the same date I saw the first Hawthorn in flower, later than last year, when it bloomed in April. From about the beginning of May the dull, unsettled weather began, and thenceforward the flowering and leafing dates began to lag behind the normal, and more and more so as the dull summer went on. The Bluebells, which had made so early a start, did not reach their peak until May 11th, which is about the normal time. Though one or two Ash trees were out so early, very few were in leaf on May 10th, and it was about the end of May before their leafing was general. I did not see Wild Dog Roses out till June 30th, and there were no Field Roses out even then, nor did I see flowers on the Broad-leaved Bellflower till July 24th, and Horse-mint at Hawksworth gathered on September 17th showed only one or two open flowers in its spike, the bulk of the inflorescence being in early bud.

The flowering of the Ash merits a special note. On April 6th trees were flowering well and had even got to young fruit stage on some female trees. On April 18th Ash trees were in full flower generally and a good many trees showed half-grown young fruit. I must record here my impression that fruiting in the Ash is very seldom indeed checked by the weather, and that when flowering is good, as in 1946, good crops of fruit follow. This opinion is based on about 20 years observation.

Secondary growth was abundant on Oaks and Sycamores in the first three weeks of July and was observed on Horse Chestnut and on a Beech hedge on July 28th.

As to the fruiting results of the season, they have been, as usual, variable, but perhaps *moderately good* best describes the results on the whole. I classify them as follows :

GOOD.—Ash, Elder, Brambles, Wild Roses (especially *Rosa mollis*), Woody Nightshade.

MODERATE.—Hawthorn, Sycamore, Holly, Rowan, Guelder Rose, Honeysuckle, Lime, Beech.

POOR.—Crab Apple, Orchard Apple, Horse Chestnut, Sloe, Bilberry.

NONE OR NEARLY SO.—Oak, Hazel.

This bare classification needs a few comments. Sycamore nearly comes into the first class, since there are some very good crops, but the general average is better described as moderate. Rowan is difficult to judge and I have myself seen no good crops apart from garden trees, but I have had fair crops reported from our chief area, Spring Wood, Hawksworth, though already much eaten by birds, so that the



crops had to be judged by the berries dropped on the ground. Beech is another tree difficult to place. Some trees have a good crop, but there are so many with no crop at all that the general average can be put a tno more than moderate, if not even poor. Holly is in rather a like category, though here it must be remembered that certainly no more than half the trees are female so that the proportion of fruiting trees never looks high in the best fruiting seasons. I think Orchard Apples nearly reach Class II, and, at any rate, though variable, are better than the Wild Crab.

These notes apply to the Shipley District, but I have been supplied with some reports on the Wharfedale area. The chief feature is that there are generally better crops in Wharfedale as illustrated by the Beech, the Holly, the Sycamore, the Guelder Rose, and the Hazel.

Bolton Abbey provided two records for trees I have not noted in the Shipley district, two trees of Hornbeam there and one Sweet Chestnut having heavy crops.

I am much indebted in compiling this report to Mr. G. A. Shaw, whose observations have provided the foundation for my fruiting report. I also owe a great deal to other members of the Bradford Naturalists' Society, especially to Mr. H. Dibb for flowering and leafing records. To all these I owe my thanks and also to Mr. Hewson, the Secretary, for putting all the Society's records at my disposal. Without these various aids I could not this year have compiled my usual report with any confidence, as ill-health has severely limited my own observations.

**HULL DISTRICT** (Miss F. E. Crackles) : Some early flowering shrubs, notably *Forsythia* and *Prunus* showed exceptionally good flowering displays. Leafing of many trees occurred early as the result of a spell of mild weather at the end of March and beginning of April.

This was followed by disastrous results when cold north-easterly and easterly winds were experienced in the latter part of April and on into May. Sides of trees exposed to the full effect of these winds presented a 'scorched effect' to an exceptional degree. Trees noted as affected included Horse Chestnut, Sycamore, Hawthorn and Beech. The worst damage appeared to be done on April 29th, when, according to data supplied by Mr. Richardson, Pearson's Park, Hull, the temperature dropped 10 degrees; a wet fog varying in intensity was experienced during the day and there was a north-east wind of force 4. Seriously affected trees showed marked secondary leafing on the exposed side, but the leaves attained no great size and little or no flowering occurred on this side. The sheltered side of such trees, on the other hand, frequently showed a good flowering display.

Secondary leafing was also noted in trees not so markedly blighted. Some Horse Chestnuts showed new leaves when fruits had already formed. This was noted to a less marked extent in Beech, and unusual secondary growth was observed in Maple.

In spite of the adverse effect of cold winds, the majority of trees showed good flowering and fruiting. On the outskirts of Hull, Apple trees have fruited well. From some parts of East Riding, however, came reports of good flowering, followed by poor crops as the result of late frosts. Hawthorns show an exceptional crop of berries, except for a few bushes which show a few or none. The latter probably flowered very early. Rose, Bramble and Rowan also show good crops of fruit.

**THIRSK** (Miss C. M. Rob) : The year has been one of the most mixed that I remember. Snowdrops and Winter Aconites were in bloom on January 12th, and by early February were in perfect flower; Crocuses also were showing. After this came the frost, which set back everything, and the signs were of a late spring. By the middle of April the plants had recovered from the setback and most were earlier than usual.

The early plants flowered extremely well; this was not so with the later ones, which grew to a large size but flowered on the whole rather poorly.

Trees and flowering shrubs were well above average in flower and fruit; the Ash was exceptionally good, as was Beech, which was so poor in 1945. The exceptions were the Elms, which have not flowered well, and some Oaks, which were badly affected by the cold winds, and the acorn crop is below average. There is a fair crop of Apples. Plums have been good, also Gooseberries and Brambles.

Secondary growth was very noticeable, especially the Horse Chestnut and some Oaks, others showed very little.



PICKERING DISTRICT (E. G. Highfield) : The winter was mild with very little snow, but the weather was chilly and dull and there was no rush of early bloom. Aconites, Snowdrops and *Omphalodes verna* were in flower in February, and on March 9th I saw *Daphne mezereum* in flower in a quarry where it has established itself, along with *D. Laureola*, which is fairly common in the woods. On the same date *Gagea lutea* was beginning to flower, but it had a poor season this year. In April we had a spell of beautiful weather and there was a very good show of all the spring flowers in the woods. The Daffodils in Farndale were very abundant, but, unfortunately, they were badly raided by motorists and their beauty spoilt. May was cold and very droughty. There was a good display of blossom, both on woodland trees and fruit trees, but it got rather badly damaged by frosts and gales.

TREES AND SHRUBS.—Blossom was abundant on all trees, but the amount of fruit is very variable. Sycamores have a very heavy crop, and also the cultivated Norway Maple, whereas the Hedge Maple seems to be devoid of fruit ; Ash keys are plentiful on some trees, but Oak and Beech have very little fruit. Of the summer flowering trees Mountain Ash and Service tree have a lot of berries, also Rose Hips, Hawthorn Hips, Elderberries, Blackberries, Barberries and Buckthorns are plentiful, but Sloes are scarce.

The wet season during July, August and September has made growth continuous over a long period, and consequently foliage has been heavy, and up to the end of September there has been very little autumn coloration or leaf fall.

SCARBOROUGH (E. R. Cross) : The season has been one of the wettest and most sunless I ever remember, especially so as the North-East Coast is considered to be the dry side of England. Partly owing to this reason secondary growths have been particularly noticeable. Oak and other trees have put out long vigorous branches, and Bracken has spread to an alarming extent all over this district.

In the arable fields *Sonchus arvensis* L. has nearly covered the growing crops. Thistles, Ragwort and Willowherb have also spread rapidly. We had long continued cold spring winds and late frosts which severely damaged the Apple and Plum crops. Bilberries, Cowberries, and Wild Raspas were, however, abundant. Brambles, on the whole, are a complete failure, unless in specially sheltered positions. Ash and Sycamore have been laden with fruit, but here Oak and Beech have fruited sparingly.

*Cornus suecica* again bloomed very sparingly, and I only found about a dozen blooms on the very large quantity of the plant at the Hole of Horcum. *Maianthemum bifolium*, on the other hand, bloomed well, and the patch appeared to have recovered its former vigour. Late in the year I was informed by the farmer that an immense growth of weeds had sprung up among it and was smothering the plants. On going out to inspect with naturalist friends, we found this to be the case, and we spent the afternoon in uprooting Willowherb and Bracken which were rampant all over the bed. *Linum perenne* did better this year than for some years past. Dodder, at Thornton Dale, was only found in a very small patch. *Triantalis europaea* L. was abundant, and the whole of one hillside at Hackness was covered with this beautiful delicate plant. *Verbascum nigrum* L. was abundant and appears to be spreading. *Campanula rapunculoides* L. did well in Forge Valley, but very few blooms were seen. *Atropa Belladonna* L. was found growing well near the Dark Arch at Scarborough. *Pyrola media* Sw. bloomed freely on Silpho Moor and appears to be more abundant than *P. minor* L. *Orchis ustulata* is more than holding its own in some places, but in others has completely disappeared.

Records Committee (W. A. Sledge) : The gradual return to something approaching pre-war conditions has been shown by the number of specimens, notes and records which have been sent in by an increased number of members in the course of the year. It is only possible to include here new or noteworthy county or vice-county records, and contributors should not assume that the absence of their records from the attached list implies that their observations are of insufficient interest. Such information is always welcome for addition to my records and will eventually, along with the matter in the annual reports, provide a basis for a revised list of Yorkshire plants.

This section has been well represented on the field excursions of the Union during the summer, although, with the exception of Mr. Good's discovery of

*Trifolium suffocatum* at Spurn, little has been added to the previously-known flora of the districts visited. Mrs. Appleyard's discovery of *Oenanthe fluviatilis* near Tadcaster and Mr. Shaw's detection of *Carex flava* at Tarn Moss, Malham, add two species new to the county. Mr. Brown's detection of *C. serotina* at Shire-oaks is also a welcome record for a species which is very rare throughout the county and which has not to my knowledge been collected in the West Riding since Amos Carr's record, cited by Lees. The finding by Dr. Taylor of *Euphorbia platyphyllos*, near Stainforth, is of equal interest as this species also does not appear to have been met with anywhere in the county for many years. Another rediscovery of particular interest has been made by Mr. F. Murgatroyd, who has re-found *Polystichum Lonchitis* in Wharfedale. Two more stations have been found on the Magnesian limestone of Mid-West Yorkshire for *Carex ericetorum*, and it may now be expected that both this species and *C. Pairaei* will be found to be considerably more widespread in the county than had been previously supposed.

Recorders' initials in the list are as follows :

J.A.	=Mrs. J. Appleyard.	C.M.R.	=Miss C. M. Rob.
J.E.B.	=Rev. J. E. Beckerlegge.	G.A.S.	=Mr. G. A. Shaw.
J.B.	=Mr. J. Brown.	W.A.S.	=Dr. W. A. Sledge.
J.A.H.	=Mr. J. A. Horne.	J.M.T.	=Dr. J. M. Taylor.
F.M.	=Mr. F. Murgatroyd.		

\*=New county record.

†=New vice-county record.

- Ranunculus Lingua* L. (64) A good patch at Farnley Lake near Otley ; J.E.B.  
*R. sardous* Crantz. (63) Stainforth, plentiful in cornfield ; J.M.T.  
*Helleborus foetidus* L. (64) Fountains Abbey ; W.A.S. Not recorded from there by the older botanists, though *H. viridis*, which I have not seen there, was. It grows amongst the shrubs on the cliff top adjacent to the Abbey and was collected there by the late Miss I. M. Roper in 1908 but does not appear to have been put on record.  
*Aquilegia vulgaris* L. (63) Yorkshire side of stream in Whitwell Wood near Shireoaks ; J.B.  
*Erysimum Cheiranthoides* L. (63) Thorncliffe, near Sheffield ; J.A.H.  
*Brassica juncea* Coss. (63) Railway embankment between Woodhouse Mill and Beighton, and on rubbish dump in Sheffield ; J.B.  
*B. alba* (L.). Boiss. (63) Hatfield ; J.M.T.  
*Bunias Erucago* L. (62) Hutton Bushel, a long way from any garden ; H. Rowntree.  
*Melandrium album* × *dioicum*. (64) Collingham ; Dr. H. Baker.  
*Agrostemma Githago* L. (63) Newly-ploughed field at Bolsterstone, Ewden Valley ; J.B.  
*Hypericum quadrangulum* L. (*H. dubium* Leers). (63) Stainforth and by canal above Thorne ; J.M.T.  
*H. humifusum* L. (63) High Green, near Sheffield ; J.A.H.  
*Erodium cygnorum* Nees. (63) Tip at Halifax ; H. Foster.  
*Ononis spinosa* L. (64) Quarry Moor, near Ripon ; J.A.  
*Medicago lupulina* L. var. *unguiculata* Ser. (64) Askham Bryan ; J.A.  
\**Trifolium suffocatum* L. (61) Kilnsea Warren ; R. D'O. Good (*Nat.*, 1946, 133).  
*T. filiforme* L. (61) Kilnsea Warren with the preceding ; Y.N.U. Excursion.  
*Anthyllis Vulneraria* L. (63) Growing on shale tips about Chapeltown, near Sheffield ; J.A.H.  
*Coronilla varia* L. (63) Still abundant near Oughtibridge railway station ; J.B.  
*Vicia sylvatica* L. (63) Railway embankment, Queensbury, abundant ; F.M.  
*Lathyrus tuberosus* L. (63) Casual on tip at Rawmarsh ; Mrs. Hoyle, per C.M.R.  
†*Agrimonia odorata* (Gouan) Mill. (61) Hunmanby cliffs ; S. M. Walters.  
*Sorbus rupicola* (Syme) Hedl. (64) Dibb Scar and Dewbottom Scar, Grasswoods. These are presumably the trees recorded by Lees in the *Supplement* under *S. latifolia* (Lam.) Pers., which they are certainly *not*. The record for that species should be deleted ; R. P. Libbey, J. E. Lousley and W.A.S.  
*Drosera longifolia* L. (62) Still at Terrington Carr ; C.M.R. and W.A.S.  
*Epilobium hirsutum* × *montanum*. (63) Black Brook, Greetland, near Halifax ; F.M., and H. Walsh.

- \**Oenanthe fluviatilis* Coleman. (64) River Cock, near Stutton; J.A. An interesting discovery which considerably extends its northern limit in England (*Nat.*, 1946, 138).
- Peucedanum palustre* Moench. (63) Askern. First seen by J.M.T. in 1943 and again by W.A.S.—one plant only—in 1946. Both this and the *Viola stagnina* with which it grows have been practically destroyed by ditching operations.
- Sambucus canadensis* L. (Det. Wilmott). (63) Between Rigby's Wire Works and S. Bradford Golf Course, Low Moor; L. Grove, per G.A.S.
- Galium uliginosum* L. (63) Hatfield Woodhouse; J.M.T.
- Galinsoga parviflora* Cav. (63) Garden weed at Woodhouse Mill, Rother Valley; J.B.
- Bidens cernua* L. (64) Pond at Arthington; T. Tyson and J.E.B.
- Arctium Lappa* L. (64) Drax, plentiful in bushy lanes south of the village; W.A.S.
- Serratula tinctoria* L. (63) Hatfield; J.M.T.
- Arctostaphylos Uva-ursi* (L.) Spreng. (63) Stenior Clough, Upper Derwent Valley, one large plant. This station is given in W. R. Linton's *Flora of Derbyshire*, but is on the Yorkshire side of the border. Several plants seen lower down the Derwent towards Slippery Stones; J.B.
- Pyrola minor* L. (61) Everingham; J.M.T.
- Monotropa hypopitys* Crantz. (62) In Forge Valley and at Thornton-le-Dale; W.A.S.
- Anagallis foemina* Mill. (64) Acomb; A. W. Ping.
- A. tetrella* (L.) Murr. (63) Crimsworth Dene, near Halifax; F.M. Not seen in the Halifax area since 1888. (64) Rombalds Moor, near Intake Gate; G.A.S.
- Omphalodes verna* Moench. (64) Fountains Abbey grounds; W.A.S.
- Myosotis sylvatica* (Ehrh.) Hoffm. (65) At 1,600 ft., on scars at head of Coverdale; C.M.R.
- Solanum nigrum* L. (63) Hatfield; J.M.T. Sandbeck Park in field of carrots; J.B.
- Veronica filiformis* Sm. (62) Adventive on banks of Swale below Catton; C.M.R.
- Polygonum viviparum* L. (65) Great Sleddale; G.A.S.
- Rumex maritimus* L. (62) Still at Dalton, near Thirsk; C.M.R. (vide *Nat.*, 1945, 24). (63) Sandbeck Park, but greatly decreased in quantity since its discovery there in 1940; J.B.
- R. maritimus* × *conglomeratus*. (63) Sandbeck Park; J.B.
- Euphorbia platyphyllus* L. (63) Stainforth, plentiful in a cornfield; J.M.T.
- Quercus Robur* × *petraea* (*sessiliflora*) (Det. E. W. Jones). (63) Camblesforth Common; superficially typical *Q. Robur*, but with abundant stellate hairs on lower surface of leaf; W.A.S.
- Salix repens* L. var. *argentea* (Sm.). (64) Above Swartha, near Silsden; A. Malins Smith.
- Listera cordata* (L.) Br. (64) In another station on Baildon Moor and on Beamsley Beacon; G.A.S.
- Scilla non-scripta* (L.) H. and L., var. *bracteata* Dr. (64) Holden Wood, near Silsden; G.A.S.
- Juncus macer* S. F. Gray. (63) Canal Bank (south side), Cross Flatts, near Bingley; R. P. Libbey.
- Luzula luzuloides* (Lam.) Dandy and Wilmott (*L. nemorosa* Poll.). (64) Clapham Beck; J.B.
- Acorus Calamus* L. (62) Still at J. B. Baker's station in the landslip pond at Kirby Knowle; C.M.R.
- Potamogeton Berchtoldii* Fieb. (Det. Dandy and Taylor). (63) Thorncliffe, near Sheffield; J.A.H.
- Blysmus compressus* (L.) Panz. ex Link. (63) Quarry near Shireoaks; J.B.
- Carex rostrata* Stokes var. *robusta* (Sond.) Dr. (64) River Ure above Ripon; J.A.
- C. distans* L. (Det. Nelmes). (63) Edge of pool in quarry, Shireoaks; J.B.
- \**C. flava* L. (Det. Nelmes). (64) Tarn Moss, Malham; G.A.S. (*Nat.*, 1946, 138).

- †*C. lepidocarpa* Tausch (Det. Nelves). (63) Quarry near Shireoaks ; J.B. Not given for V.C. 63 in *Comital Flora*, but doubtless elsewhere on the Magnesian limestone.
- C. tumidicarpa* Anders. (Det. Nelves). (64) Cocket Moss, Giggleswick. Rocks by Washburn above Dob Park Pack-Horse bridge. Shipley Glen ; J.A.H.
- C. serotina* Merat (Det. Nelves). (63) Marshy ground in quarry at Shireoaks ; J.B.
- C. ericetorum* Poll. (64) Jackdaw Crag Quarry, near Stutton, very sparingly ; G.A.S. Linton Common, near Collingham ; R. P. Libbey and J. E. Lousley.
- C. pilulifera* L. var. *longibracteata* Lange. (63) Hatfield ; J.M.T.
- C. Pairaei* Leers. (62) Terrington Coombe ; C.M.R. and W.A.S. Railway bank, Baldersby ; C.M.R.
- C. polyphylla* Kar. and Kir. (Det. Nelves). (64) Bingley. This is the plant previously recorded from here as *C. divulsa* Stokes.
- Alopecurus myosuroides* Huds. (63) Thorne ; J.M.T.
- Calamagrostis Epigeios* (L.) Roth. (63) Yorkshire side of stream in Whitwell Wood ; J.B. (64) Drax ; W.A.S.
- Avena fatua* L. (63) Newly-ploughed field, Bolsterstone, Ewden Valley ; J.B.
- Puccinellia distans* (L.) Parl. (63) Quarry at Shireoaks ; J.B.
- Bromus secalinus* L. (63) Oat field at Hollow Meadows, Upper Rivelin Valley ; J.B.
- Polystichum setiferum* (Forsk.) Woynar. (62) Mulgrave Woods ; W.A.S. (64) Woodhall, near Collingham ; W.A.S.
- P. Lonchitis* (L.) Roth. (64) Malham Moor in limestone pavements over towards Cowside Beck, several plants ; F.M. An interesting confirmation of an old station.
- Pilularia globulifera* L. (62) Great Lake, Castle Howard ; Dr. G. Taylor, per C.M.R. A recent arrival or introduction.
- Nitella opaca* Ag. (Det. G. O. Allen). (62) Catton Broad ; C.M.R.

**Ecology** (Miss D. Hilary) : Plots at Moughton have not been examined this year owing to the inaccessibility and the difficulties of transport, but Mr. Cheetham reports that the degeneration of Juniper goes on steadily on the Thieves' Moss area, though he has seen no evidence of it getting nearer to Moughton. Mr. Wattam reports that the main Juniper seedlings are still flourishing and that the wet season seems to have suited them. The seedling planted in the Moughton Soil is still alive but making little headway.

The work of the Bradford Society on the Heather Moor at St. Ives, Bingley, is continuing, though the observations have suffered somewhat from the adverse weather. On the botanical side two studies still go on, viz. (1) Observation on the regeneration of the burnt area, and (2) Observation of soil conditions and soil profiles. Our chairman hopes to bring out a special report on these at a later date.

The study of the entomology of the area has also been continued and Mr. Hincks reports that the heather shrubs which last year showed the so-called frosting, due to Heather Beetle damage, are now all dead. He suggests that the feeding processes of the beetle larvae may introduce some pathogen which may be responsible for the collapse of the plants.

**Bryology** (H. Walsh) : The year has seen the issue of *Transactions*, Part 2, 'The Yorkshire Sphagna,' and Part 3, 'The Hepaticae of Yorkshire.' These, with Part 1, 'Yorkshire Mosses,' issued in 1945, have brought up to date the known distribution of Yorkshire Bryophytes, and all workers in these groups will wish to thank those who have been instrumental in the publication of these useful lists of reference. The section has lost two of its keenest workers by the deaths of W. H. Burrell and F. E. Milsom ; one might say the mainspring of the section was broken by this loss, and it will be difficult for some time to recover the initiative they provided.



At the Spurn meeting Mr. A. Thompson recorded the moss, *Trichostomum flavovirens* as a new Yorkshire species, and Mr. C. A. Cheetham found *Tortula ruraliformis*, a sea-coast moss, plentiful; and also the var. *lanatum* of *Bryum argenteum*, an addition to V.C. 61. At Ainderby *Hypnum cordifolium* was plentiful, and this moss with *H. riparium* was the interesting find at Thorne. In the Halifax district additions to the published lists of hepatics and mosses, accounts of which have appeared in *The Naturalist*, have been *Pellia Neesiana*, well distributed about Halifax and an addition to V.C. 63, and *Fossombronia Wondraczeki*, another addition to V.C. 63 from three stations in the Mytholmroyd district. The most interesting find has been *Aplozia caespiticia* for which there is one previous Yorkshire record from Delph, where it was found in 1922. This is close to the Lancashire border and the record was somehow omitted from the Yorkshire List of Hepatics. It has been found in five different stations during 1946, and may be more frequent than the few British records suggest. The moss *Trichostomum tenuirostre*, found in a wood near Shelf, is also an addition to V.C. 63.

Dr. J. M. Taylor has found the hepatic, *Ricciocarpus natans* in the Thorne area.

**Mycology** (Miss J. Grainger) : The past year has been one of progress. Another Spring Foray for Micro Fungi was held at Thornton-le-Dale, and the same headquarters are to be used next spring. We were again fortunate in being joined by members of the British Mycological Society. Several new members have been elected to the Committee.

The high light of the year was the visit of the British Mycological Society to Whitby for their Jubilee Foray. Though the classic ground of Mulgrave Woods and Forge Valley was disappointing in the number and variety of the larger fungi, the foray was a social success, and the visitors enjoyed our Yorkshire scenery and the friendly interchange of notes and news of mycological interest. About 70 people took part in the meeting and the Yorkshire Committee was well represented.

The Public Lecture given by the President of the Union, Mr. A. A. Pearson, on the Monday evening of the Foray, resumed a practice which has been in abeyance during the war.

The Chairman's address on 'Entomycology' dealt with the relation between Entomology and Mycology and indicated some interesting problems needing solution which can only be tackled by someone with a knowledge of both branches.

Dr. Grainger, who was elected to the Plant Pathology Committee of the British Mycological Society last December, has published a paper on 'The Ecology of the Larger Fungi,' in the *Transactions of the British Mycological Society*. The ecological side of mycology, or the biological study of fungi as some prefer to call it, was the subject of a debate during the Foray. Professor Ingold, Mr. Geo. Smith, Dr. Grainger, Dr. Findlay, and others took part.

Dr. Grainger, in a lecture, illustrated with lantern slides, gave the results of an ecological study of *Erysiphe graminis*, entitled 'From Foray to Farm Practice,' in which he showed how observations made at forays may be used and elaborated into a technique for helping the farmer to combat disease and increase crop yield.

Although Mr. T. Petch is no longer able to join our Forays he continues to give us of his knowledge in papers in the *Transactions of the British Mycological Society*. A paper on *Stilbum tomentosum* Schrad. appeared in December and a note on *Myriangium* in the spring number.

An outstanding publication which should be noted by students of the Agarics is the five-volume Danish work, with coloured illustrations, *Flora Agaricina Danica* by Jacob E. Lange. The text is in English, and though the price is rather stiff, perhaps ways and means may be found of getting one or two copies to Yorkshire.

Mr. A. A. Pearson's election as President of the Union for the past year has given great satisfaction to members of the Mycological Committee, of which he has been a staunch supporter for many years. His ready help in naming specimens, his prompt replies to queries and his wide knowledge of fungi, especially the Agaricaceae and Boleti have been an untold boon to the Committee, especially in its 'lean' years. The publication in *The Naturalist* of his 'Notes on the Boleti' has greatly stimulated interest in this group and we hope further notes on other genera will speedily follow.

## CONCHOLOGY

(Mrs. E. M. Morehouse) : During the early summer there were a number of slugs and helices, though the latter had not attained full growth. As the summer progressed owing to the cold weather and the rain, molluscs had to be looked for ; it would have been quite another story if rain had been accompanied by warmth.

Mr. J. H. Lumb writes : ' A feature in the Halifax area has been the abundance of *Arion ater* L., both the black and brown ; they have been nearly all full grown.'

Mr. Arthur Smith reports *Hygromia fusca* Montagu as being very plentiful on the roadside near the cottages, Forge Valley, on June 16th ; two specimens of *Acanthinula aculeata* Müll., were taken also on a piece of wood. *Jaminea anglica* Fér., was fairly common on herbage. A search was made for *Pomatia elegans* Müll., but none were seen. (This species taken October, 1944, by E.M.M., plentiful).

On June 19th Mr. Wallace and Mr. Smith looked for *Vertigo pusilla* Müll., on the walls surrounding the old castle at Ayton, where it is supposed to occur, but were unsuccessful. *Balea perversa* L., was there in good numbers, and Mr. Smith is inclined to think the young of this species had been mistaken for it.

*Paludetrina jenkinsi* Smith was plentiful in the River Hartford. This species appears to have spread over the county. A few dead valves of *Anadonta cygnaea* L., were seen on the banks, having been thrown there when the river was dredged and cleaned. A few small forms of *L. pereger* Müll., were noted.

Mr. Smith reports that the two rare forms of *Arianta arbustorum* L., var. *baylei* Moq., and var. *canigonensis* Boubée, have not been seen in the York area for many years. The var. *luteofasciata* Duch. and Mich., is as plentiful as ever.

Mr. Cooper, of Haxby, took Mr. Smith a living specimen of *Helicigona lapicida* L., found at Brandsby in July. This is a new Yorkshire locality.

Mr. Stanley Cook found *Vallonia pulchella* Müll., *Caecilioides acicula* Fer., and *Helicella caperata* Montagu in addition to ten other molluscs when the Doncaster Scientific Society visited Broc-o-dale ; also the white variety of *Hygromia hispida* L., was taken on the same excursion. Mr. E. Stainton and Mr. S. Cook report that *Helicella virgata* da Costa is flourishing in its old habitat on one of the crags in Broc-o-dale. This was first recorded by an Ackworth master many years ago.

Mr. J. Smith, of Walsall, took *Pyramidula rotundata* var. *alba* Moq-Tan., at Hickleton, and *Limnaea truncatula* Müll., in the Hickleton Quarry.

Mr. E. Stainton found a malformed *Planorbis umbilicatus* Müll., on Potteric Carr, Doncaster, on July 7th.

During the past year, with the help of some young members, molluscs have been eagerly sought and old records have received attention in the Doncaster area.

*Zonitoides excavatus* Bean was found in Arncliffe Woods, Egton Bridge, also *Acanthinula aculeata* Müll., and a good series of *Ena obscura* Müll., were taken in Mulgrave Woods on September 19th by E.M.M. The slugs in Mulgrave Woods included many specimens of *Arion ater* var. *bifasciata*.

Miss Anderson took *Succinea elegans* Risso in Forge Valley on September 16th. Although many visits have been made to the habitat since August 24th, 1931, and the valley carefully searched, the writer has never, between 1931 and 1946, seen this particular dark red amber variety.

## ZOOLOGY

## MAMMALS, REPTILES, AMPHIBIANS AND FISHES

**Mammalia** (Mrs. A. Hazelwood) : CHIROPTERA.—Positive identifications of Bats remain all too few apart from the records of Mr. Adam Gordon from the Helmsley area. A Barbastelle was picked up alive from the floor of Helmsley Castle in January.

Much useful work on the distribution of Bats in Yorkshire could be undertaken by our more youthful and active members especially, and Bats for identification, should this be in doubt, would gladly be received by the recorder.

INSECTIVORA.—Hedgehogs again continue to be reported as road casualties in considerable numbers and seem likely to suffer even more severely with the

resurgence of road traffic. Mr. F. Dean, of Hebden Bridge, reports that he has seen more Water Shrews than in most years.

**RODENTIA.**—Mr. Chas. Procter and Mr. W. G. Bramley report that Rabbits are increasing again after a war-time depletion and Hares are similarly reported to be in greater numbers. Mr. Dean mentions that odd young black Rabbits have been noticed this year around Hebden Bridge. Mr. Pickles reports that a pair of Red Squirrels has been seen near Hazelwood and in Hayton Wood, Aberford, and Mr. C. H. Ainsworth says that they occur in some numbers near Hornsea where the Grey Squirrel has not yet appeared. The Grey Squirrel continues to extend its range and is reported from Masham by Mr. R. Chislett, and at Sutton-in-Craven by Mr. Butterfield (Cross Hills Naturalists' Society). Mr. Gordon, on the other hand, says that their numbers seem to have dwindled around Helmsley, where dead and dying examples have been seen, probably the victims of coccidiosis.

The following rather amusing incident was witnessed by Mr. Dean, who says: 'I was up at my favourite pond watching a hen Water Hen and her four chicks. She was diving to the bottom of the pond for food for them. When she succeeded in catching anything she walked out onto the far bank, offered these titbits to her young in turn, and then went back to her diving. A bit lower down the bank, two or three yards roughly, was a Water Vole, eating a hemlock leaf very hungrily. The Water Hen, tired of diving, was walking down the bank followed by her chicks in single file. She had seen the Vole and the Vole had seen her. As she got to within about a foot of him, he shrunk himself together but did not offer to bolt; quite still he was and he looked to me as if he expected her to pass by and leave him in peace. However, just when she was in the act of passing him (she looked so unconcerned) she pretended to be looking into the water. Then, like a shot, she flew at him and her extended beak pulled out some hair from his back as he attempted to do a vanishing trick under some old oilcloth. She then called excitedly to her chicks and wandered on.'

A Black Rat was found poisoned in the cellar of a church in Middlesbrough and others have been trapped in York.

The smaller rodents appear to have been present in their usual numbers.

**CARNIVORA.**—Foxes maintain their enlarged numbers despite the efforts of game keepers and farmers. The destruction of very many is reported by several correspondents. Statistics of the Dales Fox Fund, No. 1 Area, indicate that 968 Foxes have been accounted for since the Fund commenced in 1942, at an average cost of 10/9 per tail, and that the record number of tails—350—was paid for last year. Mr. W. Hargreaves reports that a Ferret put into a drain in Kildwick Grange Gill, near Keighley, on January 9th, returned showing signs of fear; the Ferret was put into the drain again but did not return so the drain was sealed until the following day; when opened it was found that the Ferret had been killed by a half-grown Fox which was then dispatched by the owner of the Ferret.

Badgers, too, have been wantonly slaughtered in some areas, one wanderer being shot in an air-raid shelter in a Middlesbrough street. One Badger was killed at Bramham cross roads in September.

Stoats are reported to be especially numerous at Spurn by Mr. Ainsworth, who also records a large Seal of undetermined species from the same area.

**UNGULATA:** Mr. R. M. Garnett records both Red and Fallow Deer from Dalby Forest where they have been seen by the forestry keeper. The Fallow Deer have been seen for several years past and are no doubt escaped from a private park. The Red were two young bucks, but whether they were wild animals spreading from the west where they are abundant in parts is not established.

**Reptilia** (Mrs. A. Hazelwood): Mr. R. M. Garnett reports an Adder killed on February 27th in Dalby Forest—an early date with snow lying at the time. A blue-bellied variety was killed in the same area in April.

**Amphibia** (Mrs. A. Hazelwood): Mr. Chas. Procter believes that the Palmated Newt is steadily disappearing from Holderness. This Newt is newly recorded from ponds near Middlesbrough by Mr. O. C. Hill. Frog spawn, in a partly frozen pond, was first noted on February 2nd by Mr. Dean, at Bingley. Some of this spawn was taken into Bingley College, but only six tadpoles hatched.



Frogs were noticed spawning at Aberford on March 1st, and at Keld Head, Pickering, on March 13th; the spring water there is warmer than at Ellerburn, where spawn was only found on March 26th. In the Huddersfield district the winter of 1945-46 brought but little snow, but the frost severity in February was intense when the registration of frost was 24 degrees F. on the 11th, 26 degrees on the 13th (the coldest in Britain), 21 degrees on the 18th, and 22 degrees on the 19th. From March 1st to 6th the night frosts were again severe. A change to mild conditions ensued on March 11th, and the first Frog spawn was noted at Newsome on the 15th, practically a month later than in previous years. It appears that generally both Frogs and Toads were late in spawning and in some areas spawned only sparsely.

**Pisces** (Mrs. A. Hazelwood) : Fish reports for the year are not numerous and there are no marine records. We miss the enthusiastic work of the late W. J. Clarke.

Sea fishing this year has been characterised by record catches in the North Sea, Dogger Bank, Iceland, and Bear Island, and Halibut, Turbot, Plaice and Haddocks have been landed in great quantities and large sizes. Mr. C. F. Procter mentions that it is perhaps interesting to note that things like Jumbo Haddocks and large Turbot and Plaice, which at one time had almost gone off the market, are now a common feature of the trawler catches. This is probably a direct result of the partial cessation of the intensive trawling by all the European countries with seine and otter trawls, and possibly also as a result of a prolonged close season.

The reduced amount of angling during the war seems to have resulted in ponds and rivers being better stocked than in pre-war years.

The Pocklington Canal has again given trouble, Roach and Tench being the principal victims on this occasion.

Barbel have appeared in large numbers in the River Ouse, odd fish even being taken below Fulford where they have hitherto been rarely seen.

Two Salmon are reported from the River Yore by Sir T. Willans-Nussey, Bart.

Good Trout (from 1-2½ lb.) have been taken from the West Beck at South Cave, where Pike and Chub have increased, the latter having been caught weighing up to 3½ lbs. The West Beck is shortly to be netted and the coarse fish removed, to be replaced by 500 two-year-old Trout. Roach in the York district were very late in spawning and were only getting into good condition in September. A Roach of 1 lb. 8½ oz. was taken from the Ouse near York.

Grayling have been introduced into the lower and middle Wharfe (where they have been extinct for many years) as the result of grants of fish from the Yorkshire Fisheries Board. Two weighing 1½ and 1¾ lbs. respectively were caught below Howsham Bridge on the River Derwent.

Mr. W. Greaves says that at Halifax angling has reached a popularity it has not enjoyed for many years, largely due to the canal through the Calder valley having been restocked with the usual coarse fish.

Captain Evans reports that the Doncaster Angling Association have netted the Thrybergh Reservoir and took about 50,000 Roach, many big ones, but none over 2 lbs. weight, and many small ones, but none of intermediate size (the water was very low two years ago and there was a big invasion of gulls). Some of the small Roach were sent to Leeds University and they all proved to be infested with tape-worm. There was a great number of Sticklebacks and a few Loach and Bullheads, but very few Trout (only about twenty) were netted, the biggest of which was under 3 lbs.

Lampreys have been obtained from the Rivers Wharfe and Ouse, and of those brought back to the Leeds University laboratory from Tadcaster one was a fully mature male and another a mature female, which shed their sperm and eggs, and the ammocete larvae which hatched out from the fertilised eggs were reared in the laboratory.

In addition to those naturalists mentioned in the above reports we must also thank the following for their kind co-operation : Messrs. E. W. Taylor (York), F. H. Edmondson (Utley), R. Procter (Leeds), W. E. L. Wattam (Huddersfield), W. G. Bramley (Bolton Percy), and the members of the Cross Hills Naturalists' Society, the West Beck Preservation Society, and the York Amalgamation of Anglers (Hon. Secretary, D. Longstaffe).



## ORNITHOLOGY

(Ralph Chislett) : The Annual Report for 1945 was reprinted and circulated to contributors, and met with a favourable reception inside and outside the county.

Despite much inclement weather, field-work has been well maintained, and the Committee was represented officially at the summer meetings of the Union at Spurn, Ainderby and Ilkley. Field-glasses and a serious interest in birds are much more in evidence at these meetings now than was the case a few years ago.

There were not many occurrences of special note in the breeding season. A Heronry in lower Wensleydale had not previously been included in our records. The Black-necked Grebe and the Black Redstart bred in the county in 1946.

The Wild Birds' Protection Acts Sub-Committee has been active in the North Riding, where Montagu's Harriers have bred, and at Hornsea Mere and at Spurn, where Little Terns suffered from picnicking parties who motored down the new military road. A smaller number of young Terns were reared than usual, and additional action is needed before the 1947 breeding season. The Hon. Treasurer's report showed an increased balance in hand of £118 4s. 7d., largely due to the legacy of £50 from the late W. J. Clarke, of Scarborough.

The Sub-Committee appointed to develop the Observatory and Ringing-trap at Spurn has made good progress, mainly by the sustained efforts of G. H. Ainsworth and J. Lord. The cottage has been furnished with essentials, and acknowledgments are due to many for gifts of furniture, bedding, utensils, books, financial assistance and practical work. Occupied as it has been by a number of parties, the opinion that the cottage would eventually be self-supporting is confirmed by the present balance in hand of £27 15s. 10d. The members of the Ringing Sub-Committee have met there and have passed periods under the cottage roof.

On October 5th a meeting was held at the cottage of the Bird Observatories Committee of the British Trust for Ornithology, to which we had been invited to appoint a delegate, and had appointed R. M. Garnett. With Mr. W. B. Alexander in the chair, and Miss E. P. Leach present, reports were heard from all four observatories (Stockholm, Fair Isle, May and Spurn). The proceedings were sufficiently informal to allow participation of other members of the Y.N.U. who were at Spurn on that day. We are obliged to this National Committee for useful advice and practical help. It was good that the most interesting species caught and ringed at Spurn should be a Red-breasted Flycatcher during Mr. Alexander's stay there. To date (October 31st) 285 birds have been ringed, covering some 30 species.

The War Department has been very helpful, and practical sympathy with our aims was shown in July in a visit by the G.O. C. in C. Northern Command, Lieut.-General Sir A. F. P. Christison, Bart., K.B.E., himself a good ornithologist, whose departure in 1947 for the Scottish Command we much regret.

With his return from the Navy, Alfred Hazelwood (54 Somerset Road, Bolton) has resumed examination of avian casualties, which it is hoped members are now sending to him. Skins worth keeping will eventually be placed in the Yorkshire Museum, York, and those of specific, or sub-specific, importance will be reported upon.

The more continuous watching at Spurn will result in added interest to the detailed report of the year, and may increase its length. Final data for the 1946 Report should be sent in as soon after December 31st as possible, to enable proofs to be in the hands of members before the meeting of the Vertebrate Section on March 8th, 1947.

## ENTOMOLOGY

**Lepidoptera** (E. Dearing) : Inclement meteorological conditions have produced some ill-effects both on the flight and general well-being of Lepidoptera and have curtailed the activities of observers to some extent. It has been noted that the warm spell in spring appeared to modify the appearance of many species, particularly in the Bradford district. Examples of extreme defoliation have been noted. Larvae of *pisi* and *lucipara* cleared patches of bracken at Kirkstall, and larvae of *chrysorrhoea* defoliated the hedges at Kirkdeighton and Rufforth. The larvae of *pisi* at Kirkstall were heavily parasitised, and it is surmised that larvae of *caja* and *jacobaea* suffered a similar fate.

This report is compiled from material supplied by Messrs. M. D. Barham, of Chapel Allerton, Leeds; W. Barraclough, of Low Moor; E. G. Bayford, F.R.E.S., of Barnsley; W. G. Bramley, of Bolton Percy; J. M. Brown, B.Sc., F.R.E.S., of Robin Hood's Bay; C. A. Cheetham, F.R.E.S., of Austwick; R. Procter, of Leeds; D. M. Jesper, of Harrogate; A. Smith, of Heworth, York; H. Spencer, of Elland; A. Thompson, of Skipton, for Grassington; D. F. Walker, of Shipley; W. E. L. Wattam, of Newsome, Huddersfield; G. B. Walsh, M. Ellison and E. Croston, of Scarborough; and the Wakefield Naturalists' Society, to whom I am very much indebted. The nomenclature is Meyrick's, 1927. All records have been included as received since they are valuable in the checking and revision of the Yorkshire List.

15. *N. mundana* L. Larvae common June, imagines July, Forge Valley, Scarborough.
16. *T. jacobaeae* L. Larvae common, many parasitised, 8/8, Danes Dyke, Bridlington.
28. *A. caja* L. Scarce, Harrogate; isolated larvae from Acomb and Askham Bog were both parasitised.
40. *A. leporina* L. One, 23/7, Rombolds Moor; one larva, September, Harrogate and one October, Allerthorpe, both on *Betula*.
45. *A. psi* L. Not so common as usual, Harrogate.
56. *B. perla* Fabr. One imago, Elland (unusual in this area); few at Menston and Shipley Glen.
61. *O. ochracea* Hübn. At light, September, Alwoodley and Kirkstall.
66. *R. tenebrosa* Hübn. 3/10 at Oakenshaw.
75. *P. tenebrata* Scop. One imago, 8/6, near Knaresborough.
108. *H. lucipara* L. Larvae unusually abundant, with *pisi*, on bracken, Kirkstall.
177. *G. ditrapezium* Börkh. One imago at sugar, Low Moor.
280. *A. comma* Linn. One imago, Elland (the first local record).
282. *M. opima* Hübn. One imago, Low Moor.
315. *M. oleracea* L. One at light, May, Scotton; several at light, May-June, Harrogate; larvae not so plentiful at Leeds.
316. *M. pisi* L. Larvae common on *Ranunculus* sp., September, Harrogate; abundant on bracken at Kirkstall, on knot grass in other Leeds districts.
367. *P. moneta* L. One pupa on Delphinium, Newsome; Low Moor; three at light, 2/7, Beeston.
368. *P. chrysis* L. Common at light, July, Harrogate; larvae on mint in spring, Beeston.
374. *P. iota* L. Plentiful from 29/9, Huddersfield.
376. *P. gamma* L. Not so numerous as 1945, Harrogate and Beeston.
382. *D. caeruleocephala* L. Two larvae on hawthorn, 11/6, Scotton.
389. *P. chrysorrhoea* L. One, Low Moor; larvae common June, Scotton; hedges defoliated, Kirkdeighton and Rufforth; imagines common, 3/8, Driffild; common at street lamps, 3-10/8, Bridlington.
431. *N. strigata* Müll. One larva from Buttercrambe emerged between 15-23/6.
438. *G. papilionaria* L. One, Low Moor; one at light, 10/7, Harrogate.
451. *E. denotata* Hübn. One, Low Moor.
472. *E. trisignaria* H.-Schaff. 25/7, Buttercrambe Woods.
476. *E. pusillata* Fabr. 15/5, plentiful, Buttercrambe Woods.
488. *E. scabiosata* Börkh. One imago, 21/6, Low Moor.
497. *E. plagiata* L. 7/8, Warthill (rare at York, A.S.).
507. *E. populata* L. Common, August, Ilkley Moors.
527. *H. sordidata* Fabr. Common, August, Ilkley Moors.
536. *H. caesiata* Lang. Common, August, Ilkley Moors.
558. *H. polygramma* Börkh. 12/8, Low Moor.
566. *E. blomeri* Curt. 16/6, Forge Valley.
579. *X. didymata* L. Common, August, Ilkley Moors.
598. *O. luteolata* L. Common as usual at light, May-June, Harrogate.
634. *B. betularius* L. v. *doubledayaria* Mill. Harrogate.
636. *A. sylvata* Scop. Three imagines, 18/5 and 8/6, near Knaresborough; Imagines abundant in wood near Darrington, June.
638. *A. marginata* L. One, 8/6, near Knaresborough.

643. *P. macularia* L. Shipley Glen.  
 656. *O. sambucaria* L. Low Moor; three at light, 11/7, Harrogate.  
 658. *M. margaritaria* L. Two larvae, birch, May, Harrogate, emerged June.  
 660. *M. dolabraria* L. One larva, Skipwith, emerged 19/5.  
 661. *E. prunaria* L. Low Moor.  
 664. *S. bilunaria* Esp. Common at light, April, Harrogate.  
 673. *E. quercinaria* Hüfn. One at light, August, Harrogate.  
 675. *G. bidentata* Clerck. Several at light, May-June, Harrogate.  
 676. *C. elingvaria* L. One at light, August, Harrogate; common, August, Ilkley Moors.  
 688. *M. stellatarum* L. Two at Phlox, 28/7, Buttercrambe; several at Buddleia, 11-26/8, Robin Hood's Bay; one at Convolvulus, 8/8, Bridlington, north side; one at Valerian, 28/7, Chapel Allerton.  
 690. *D. elpenor* L. Larva common, York, Low Moor, Harrogate, Leeds. Parasitised at Low Moor.  
 693. *D. lineata* Fabr. Large ♀, 27/7, Scalby, Mr. H. Huggins.  
 698. *S. convolvuli* L. -/8/45, Woodlands, Harrogate.  
 700. *S. populi* L. Imago, June, Harrogate; larvae, September, Allerthorpe.  
 701. *S. ocellatus* L. Many larvae, York, on apple at Copmanthorpe and Fangoss. Pupa dug in January emerged May, Harrogate; larva, 15/7, Secker Wood. Seamer Moor, Silpho Moor, Harwood Dale (larvae fairly common).  
 706. *N. ziczac* L. Larva, September, Allerthorpe. Ravenscar, Seamer Moor, Silpho Moor, Harwood Dale (a partial second brood noted).  
 707. *N. dromedarius* L. Larvae common on *Betula*, September, Allerthorpe Common, Hookstone Wood, Harrogate, and Templenewsam. Raincliffe Wood.  
 711. *D. tremula* Clerck. Burniston.  
 719. *O. camolina* L. A few larvae, September, Templenewsam. Generally distributed and larvae common, Scarborough.  
 724. *C. bifida* Hübn. Imago at Scarborough; larvae at Throxenby.  
 725. *C. furcula* L. Harwood Dale.  
 727. *P. bucephala* L. Low Moor; small larva on *Betula*, September, Allerthorpe; larvae common, Templenewsam and Kirkstall.  
 728. *S. pavonia* L. 14/5. Assembled near Black Bull Hotel, Blubberhouses, twenty ♂ taken with good range of size after delay of about twenty minutes before attraction took effect; ♀ was then moved 150 yds. across wind when six ♂ found her within two minutes.  
 733. *A. aglaia* L. ♂, 15/7, Seckar Wood; none seen this season, Robin Hood's Bay.  
 736. *A. selene* Schiff. Very few, 20/7, Robin Hood's Bay; fairly plentiful, July, Austwick and Lawkland Mosses.  
 740. *V. c-album* L. One, 11/10, near Harrogate station.  
 741. *V. urticae* L. First seen, 27/3, Barnsley; rare early, more frequent later, Elland; first seen, 26/3, many, 28 and 29/9, Robin Hood's Bay; most prominent of butterflies, Huddersfield; plentiful in spring, scarce in autumn, Low Moor; all broods in usual numbers, Harrogate.  
 744. *V. io* L. 14/4, Henlaugh, Tadcaster; 12/5, Cawood; one only, September, Woodlands, Harrogate; several, first seen, 29/3, Austwick. One at Broxa and other isolated specimens in the Scarborough district.  
 745. *V. atalanta* L. Less common than usual, Barnsley; few early, more common later, Elland; a few, late July, Robin Hood's Bay; some, late September, Huddersfield; spring plentiful, autumn scarce, Low Moor; odd imagines only, Harrogate and Austwick.  
 746. *V. cardui* L. Uncommon, Barnsley; fairly plentiful, second brood, Elland; a few, 12 and 20/7 and 16/8, Robin Hood's Bay; several early in July, Huddersfield; only odd ones, Austwick. One at Falcon Inn; very scarce this season.  
 750. *M. galathea* L. Several on the Wolds, Mr. Burley.  
 752. *P. megera* L. Not so common, Bolton Percy; one only, 23/5, Robin Hood's Bay; odd imagines, 8/8, Danes Dyke, Bridlington; 13/6, Bishopwood.

753. *S. semele* L. Harwood Dale and Seamer Moor.  
 755. *E. janira* L. Fairly common, Barnsley; fairly numerous, 20/6 and 8/8, Robin Hood's Bay; usual numbers, July, Harrogate.  
 756. *E. hyperanthus* L. A few, 8/8, Danes Dykes Dyke, Bridlington.  
 759. *C. tiphon* Rott. 17/6, Whitby Moors.  
 760. *C. pamphilus* L. Not so plentiful as usual, 20/5-25/6, Robin Hood's Bay; common, 11 and 12/7, Harrogate; common, September, Allerthorpe.  
 761. *N. lucina* L. 9/6, Pickering.  
 762. *T. rubi* L. Fairly plentiful, 13/5, Austwick and Rothwell; one, 23/5, on edge of Rumbold's Moor, near Burley Woodhead.  
 770. *C. astrarche* Bergst. Many, 20/6, Bastow Wood, Grassington.  
 771. *C. phlaeus* L. Less common than usual, Barnsley, Robin Hood's Bay, Newsome, Elland, Low Moor. As usual, Harrogate.  
 774. *L. argiolus* L. Three, early June, York, Mr. Burley. One in May in Stepney Drive, Scarborough (H. W. Dobson, Esq.); One Seamer Moor in August.  
 778. *L. icarus* Rott. Comparatively few seen, 28/6-20/7, Robin Hood's Bay; common, ♂ outnumbering ♀, 11 and 12/7, Woodlands, Harrogate.  
 782. *G. rhamni* L. 13/6, Bishopwood.  
 783. *E. cardamines* L. Several, 16/5-11/6, Robin Hood's Bay; one ♀ only, 22/6, Knaresborough.  
 786. *P. napi* L. Less common than usual, Barnsley; fairly common, Elland; most scarce, Newsome.  
 787. *P. rapae* L. Small numbers, Elland.  
 788. *P. brassicae* L. More common in autumn, Bolton Percy, severely parasitised last year and in spring; less common than usual, Barnsley, Newsome and Elland.  
 794. *P. sylvinus* Esp. Very few, 28/6, Robin Hood's Bay.  
 859. *C. hamellus* Th. 11/8, Allerthorpe Common.  
 873. *C. pinellus* L. 11/8, Allerthorpe Common.  
 1006. *E. populi* L. Larva on willow, June, Askham Bog.  
 1008. *E. rubi* L. Larvae, October, Leeds Road, Harrogate; fairly common, September, Wykeham Low Moor, Scarborough.  
 1017. *Z. filipendulae* L. } Common, 11-12/7, Woodlands, Harrogate.  
 1018. *Z. lonicerae* Esp. }  
 1024. *P. geryon* Hübn. On Helianthemum, 20/6, Bastow Wood, Grassington.  
 1066. *P. atricapitana* Steph. Plentiful, 21/6, Burniston.  
 1242. *E. nanana* Treits. Plentiful on *Pinus abies*, 28/5, Warthill; 28/5, Strensall.  
 1286. *A. semifasciana* Hw. One worn imago, 24/7, Askham Bog; one emerged 26/6 from larvae beaten earlier.  
 1297. *A. dimidiata* Sodof. 8/8, Strensall.  
 1329. *H. acuminatana* Zell. 21/6, Burniston. 9/8/45, Haxby.  
 1346. *P. regiana* Zell. Bossal Woods, York, from larvae under bark of maple, emerged 25/4 to end of June.  
 1366. *L. internana* Guen. Skipwith, 19/5.  
 1368. *L. compositella* F. 26/6, Strensall.  
 1389. *A. atrella* Hw. 7/8, Warthill.  
 1391. *A. tenebrella* Hüeb. 18/6, Scarborough.  
 1408. *A. hermannella* F. 2/7, Malton Road, York.  
 1417. *T. aethiops* West. 9/7, Wass Bank.  
 1439. *G. diffinis* Hw. 21/5, Warthill, plentiful.  
 1451. *G. cuneatella* Dougl. 7/8, Warthill.  
 1494. *S. vorticella* Scop. 21/7, Allerthorpe Common.  
 1495. *S. taeniolella* Zell. Malton Road, York, and Buttercrambe, 25/7.  
 1624. *A. culiciformis* L. Colony still very strong, Templenewsam.  
 1655. *G. schoenicolella* St. 21/5, Malton Road, York.  
 1694. *E. triatomea* Hw. 21/6, Malton Road, York.  
 1872. *L. lautella* Zell. 24/5/44, Strensall.  
 1980. *B. cidarella* Zell. 10/6/42, Strensall.  
 1982. *B. ulmella* Zell. 9/5/44, plentiful, Malton Road, York.  
 2026. *O. vacculella* F. v. R. 1/8, Castle Howard.  
 2053. *A. croesella* Scop. 26/6, Strensall.  
 2054. *A. rufimitrella* Scop. 9/6, Pickering.



## APPENDIX

1946 RECORDS OF LEPIDOPTERA IN WAKEFIELD AREA  
By the Wakefield Naturalists' Society. Leader : J. Hooper, Esq.

16.	<i>T. jacobaeae</i> L.	Woolley	6/6	406.	<i>P. aversata</i> L.	Chevet	1/8
21.	<i>D. mendica</i> Clerck.	Sandal	23/5	414.	<i>L. immutata</i> L.	Chevet	8/7
23.	<i>D. menihastri</i> Esp.	Chevet	10/5	438.	<i>G. papilionaria</i> L.	Chevet	19/8
24.	<i>D. lubricipeda</i> L.	Walton	30/5	466.	<i>E. lariciata</i> Fr.	Walton	4/6
28.	<i>A. caja</i> L.	New Miller Dam	1/8	485.	<i>E. nanata</i> Hübn.	Walton	11/7
44.	<i>A. tridens</i> Sch.	Chevet	9/6	507.	<i>E. populata</i> L.	Chevet	5/8
45.	<i>A. psi</i> L.	Ryhill	26/5	510.	<i>P. hastata</i> L.	Walton	4/6
46.	<i>A. megacephala</i> F.	Chevet	6/8	511.	<i>P. tristata</i> L.	Chevet	9/5
48.	<i>A. rumicis</i> L.	Walton	3/7	513.	<i>P. sociata</i> Börkh.	Chevet	28/5
56.	<i>B. perla</i> F.	Walton	14/7	514.	<i>P. galiata</i> Hübn.	Woolley	1/8
60.	<i>A. tragapogonis</i> L.	Wakefield	6/7	522.	<i>H. fulvata</i> Forst.	Walton	6/8
61.	<i>O. ochracea</i> Hübn.	Horbury	20/8	532.	<i>H. silaceata</i> Hübn.	Chevet	23/7
80.	<i>C. trapezina</i> L.	Chevet	29/7	535.	<i>H. corylata</i> Th.	Chevet	28/5
86.	<i>C. micacea</i> Esp.	Horbury	10/8	553.	<i>H. decolorata</i> Hübn.	Chevet	28/5
99.	<i>C. quadripunctata</i> F.	Horbury	6/8	556.	<i>H. bilineata</i> L.	Chevet	28/6
106.	<i>M. maura</i> L.	Wakefield	16/8	561.	<i>O. brumata</i> L.	Wakefield	7/10
107.	<i>H. meticulosa</i> L.	Wakefield	1/5	564.	<i>E. oblitterata</i> Hüfn.	Chevet	17/6
112.	<i>H. gemina</i> Hübn.	Chevet	10/7	569.	<i>A. dilutata</i> Börkh.	Coxley	5/10
113.	<i>H. polyodon</i> L.	Chevet	7/8	574.	<i>X. limitata</i> Scop.	Chevet	3/8
115.	<i>H. lithoxylea</i> F.	Wakefield	10/7	575.	<i>X. plumbaria</i> F.	Midgeley	9/7
131.	<i>H. didyma</i> Esp.	Horbury	10/7	579.	<i>X. didymata</i> L.	Chevet	14/5
135.	<i>H. nictitans</i> Börkh.	Wakefield	10/8	585.	<i>X. firmata</i> Hübn.	Walton	4/6
140.	<i>H. strigilis</i> Cl.	Chevet	14/7	586.	<i>X. montanata</i> Börkh.	Chevet	24/5
141.	<i>H. fasciuncula</i> Haw.	Wakefield	20/7	587.	<i>X. fluctuata</i> L.	Chevet	23/5
147.	<i>E. segetum</i> Schiff.	Horbury	16/7	589.	<i>X. olivata</i> Börkh.		
152.	<i>E. exclamationis</i>			593.	<i>O. atrata</i> L.	Ryhill	13/6
	Linn.	Horbury	10/7	595.	<i>E. aescularia</i> Schiff.	Chevet	31/3
169.	<i>G. augur</i> F.	Wakefield	15/6	596.	<i>B. parthemas</i> L.	Chevet	31/3
178.	<i>G. triangulum</i> Hüfn.	Chevet	9/7	598.	<i>O. luteolata</i> L.	Woolley	5/5
179.	<i>G. pronuba</i> L.	Woolley	4/7	601.	<i>S. liturata</i> Clerck.	Walton	4/6
183.	<i>G. xanthographa</i> F.	Horbury	6/8	604.	<i>S. wauria</i> L.	Wakefield	10/7
191.	<i>G. typica</i> L.	Sandal	10/7	609.	<i>E. biundularia</i>		
221.	<i>O. fulvago</i> L.	Bretton	17/8		Börkh.	Chevet	9/5
226.	<i>O. litura</i> L.	Horbury	8/8	610.	<i>E. consonaria</i> Hübn.	Walton	4/6
227.	<i>O. pistacina</i> F.	Horbury	6/8	616.	<i>S. repandata</i> L.	Chevet	7/7
231.	<i>O. suspecta</i> Hübn.	Chevet	23/7	619.	<i>S. gemmaria</i> Br.	Walton	14/7
235.	<i>M. oxyacanthae</i> L.	Horbury	8/9	621.	<i>B. pinarius</i> L.	Walton	4/6
255.	<i>P. chi</i> L.	Chevet	3/8	624.	<i>H. leucophaearia</i> Sch.	Chevet	29/3
268.	<i>L. impura</i> Hübn.	Sandal	12/7	625.	<i>H. marginaria</i> Börkh.	Wakefield	10/3
269.	<i>L. pallens</i> L.	Sandal	12/7	627.	<i>H. defoliaria</i> Cl.	Coxley	5/10
271.	<i>A. lithargyrea</i> Esp.	Horbury	16/7	634.	<i>B. betularius</i> L.	Chevet	28/6
280.	<i>A. comma</i> L.	Horbury	16/6	635.	<i>A. grossulariata</i> L.	Woolley	29/6
289.	<i>M. gothica</i> L.	Wakefield	10/4	636.	<i>A. sylvata</i> Scop.	Chevet	14/6
290.	<i>C. graminis</i> L.	Coxley	17/8	638.	<i>A. marginata</i> L.	Chevet	28/5
308.	<i>M. glauca</i> Hübn.	Woolley	12/7	647.	<i>P. petrarua</i> Hübn.	Walton	8/5
315.	<i>M. oleracea</i> L.	Wakefield	6/6	654.	<i>D. pusaria</i> Linn.	Ryhill	25/5
316.	<i>M. psi</i> L.	Chevet	9/7	656.	<i>O. sambucaria</i> L.	Sandal	8/7
321.	<i>M. brassicae</i> L.	Sandal	28/7	669.	<i>C. pennaria</i> L.	Coxley	10/10
331.	<i>A. nemoralis</i> F.	Walton	2/7	676.	<i>G. elinguarua</i> L.	Chevet	3/8
340.	<i>H. proboscidalis</i> L.	Walton	2/8	684.	<i>P. flavicornis</i> L.	Chevet	31/3
346.	<i>S. libatrix</i> L.	Walton	28/9	688.	<i>M. stellatarum</i> L.	Woolley	12/7
355.	<i>E. mi</i> Clerck.	Walton	7/7	690.	<i>D. elpenor</i> L.	Nostell	June
367.	<i>P. moneta</i> F.	Horbury	10/6	701.	<i>S. ocellatus</i> L.	Nostell	June
368.	<i>P. chrysitis</i> L.	Horbury	10/7	727.	<i>P. bucephala</i> L.	Nostell	June
376.	<i>P. gamma</i> L.	Chevet	2/6	733.	<i>A. aglaia</i> L.	Woolley	11/7
381.	<i>A. triplasia</i> L.	Horbury	2/9	741.	<i>V. urticae</i> L.	Chevet	29/1
389.	<i>P. chrysorrhoea</i> L.	Walton	10/7	744.	<i>V. io</i> L.	Walton	16/4
398.	<i>P. virgularia</i> Hübn.	Chevet	30/8	745.	<i>V. atalanta</i> L.	Sandal	12/9
399.	<i>P. straminata</i> Tr.	Chevet	6/6	746.	<i>V. cardui</i> L.	Woolley	6/7

## APPENDIX—continued

752. <i>P. megaera</i> L.	Chevet	23/5	794. <i>P. sylvanus</i> Esp.	Ryhill	21/6
755. <i>E. janira</i> L.	Walton	28/6	798. <i>C. glauca</i> Scop.	Chevet	12/8
760. <i>C. pamphilus</i> L.	Midgeley	24/6	800. <i>F. falcatoria</i> L.	Walton	4/6
771. <i>C. phlaeas</i> L.	Woolley	4/7	1017. <i>Z. filipendulae</i> L.	Woolley	4/7
778. <i>L. icarus</i> Rott.	Woolley	6/7	1018. <i>Z. loniceræ</i> Esp.	Nostell	5/7
782. <i>G. rhamni</i> L.	Ryhill	13/6	1037. <i>Z. pyrina</i> L.	Horbury	16/7
783. <i>E. cardamines</i> L.	Chevet	23/5	1107. <i>T. viridana</i> L.	Chevet	26/6
786. <i>P. napi</i> L.	Chevet	21/4	2131. <i>H. hectus</i> L.	Walton	4/6
787. <i>P. rapae</i> L.	Walton	16/4	2133. <i>H. velleda</i> Hübn.	Chevet	5/7
788. <i>P. brassicae</i> L.	Walton	16/4	2135. <i>H. humuli</i> L.	Wakefield	10/6

**Trichoptera** (H. Whitehead) : Through the kindness of Mr. W. D. Hincks. I have been able to examine 91 specimens of Trichoptera collected by himself and Mr. J. Wood. The species in most cases has been determined, though a few specimens have been set aside for examination by a referee. But for this good fortune the report would have been a very short one.

An excursion to Askham Bog in company with Messrs. W. D. Hincks, B. A. Cooper and Robert Procter resulted in the capture of several specimens of caddis, all of which belonged to species already recorded from that locality. Visits to Goathland and to Chapel-le-Dale yielded only a few specimens. The season's cold, and later, wet weather, was no doubt partly responsible for this.

In the list below there are no additions to the county list, but three species are new V.C. records, viz., *Colpotaulius incisus*, new to V.C. 62; *Sericostoma personatum*, new to V.C. 63; and *Chimarra marginata*, new to V.C. 65.

*Phryganea obsoleta* McLach. Robin Hood's Bay, 12/7/46 (J.M.B.).

*Nannophryganea minor* Curt. Askham Bog, 15/6/46 (W.D.H.).

*Colpotaulius incisus* Curt. Raincliffe Woods and Forge Valley, 12/6/43 (W.D.H.); Askham Bog, 15/6/46 (H.W.).

*Glyptotaelius pellucidus* Retz. Askham Bog, 15/5/42 (W.D.H.), 27/5/44 (J.W.), 15/6/46 (R.P.).

*Limnophilus stigma* Curt. Askham Bog, 1/8/42 (W.D.H.).

*L. lunatus* Curt. Bramhope Pond, near Leeds, 10/10/46 (H.W.).

*L. vittatus* F. Holmehouse Wood, near Keighley, 2/10/43 (J.W.).

*L. auricula* Curt. Askham Bog, 27/5/44 (J.W.), 15/6/46 (B.A.C.); Allerthorpe Common, 28/6/42 (W.D.H.).

*Limnophilus griseus* L. Allerthorpe Common, 28/6/42 (W.D.H.).

*L. extricatus* McLach. Old Cut R., Keighley, 25/5/43 (J.W.).

*L. luridus* Curt. Askham Bog, 15/6/46 (H.W.).

*L. sparsus* Curt. Holmehouse Wood, near Keighley, 23/8/41, 12/9/42 (J.W.); Allerthorpe Common, 28/6/42 (W.D.H.); Askham Bog, 27/5/44 (J.W.); 15/6/46 (W.D.H.); Robin Hood's Bay, 23/8/46 (J.M.B.).

*Anabolia nervosa* Curt. Cawthorne, Bretton Hall Park, 29/9/41 (W.D.H.).

*Drusus annulatus* Steph. Holmehouse Wood, near Keighley, 6/9/42, 19/9/42 (J.W.); Brans Ghyll, Horton-in-R., 30/6/42, Dauk Ghyll, Horton-in-R., 29/6/42 (W.D.H.).

*Chaetopteryx villosa* F. Holmehouse Wood, near Keighley, 12/10/42, 18/10/42 (J.W.).

*Sericostoma personatum* Spence. Holmehouse Wood, near Keighley, 27/6/42 (J.W.); Dauk Ghyll, Horton-in-R., 29/6/42 (W.D.H.).

*Silo pallipes* F. Holmehouse Wood, near Keighley, 12/7/42 (J.W.); Dauk Ghyll, Horton-in-R., 29/6/42 (W.D.H.); Robin Hood's Bay, 26/7/46, 24/8/46 (J.M.B.).

*Beraea maurus* Curt. Goathland, 6-15/7/46 (H.W.).

*Odontocerum albicorne* Scop. Goathland, 6-15/7/46 (H.W.).

*Leptocerum albifrons* L. Cowthorpe, 3/8/42 (W.D.H.).

*L. bilineatus* L. Goathland, 6-15/7/46 (H.W.).

*Hydropsyche pellucidula* Curt. Ling Ghyll, Horton-in-R., 2/7/42, Dauk Ghyll, Horton-in-R., 29/6/42 (W.D.H.).

*Cheumatopsyche lepida* Pict. Cowthorpe, 3/8/42 (W.D.H.).

*Diplectrona felix* McLach. Holmehouse Wood, near Keighley, 4/7/42 (J.W.).

- Polycentropus flavomaculatus* Pict. Goathland, 6-15/7/46, God's Bridge, Chapel-le-Dale, 26/8/46 (H.W.).
- Cyrnus trimaculatus* Curt. Cowthorpe, 3/8/42, (W.D.H.) ; Goathland, 6-15/7/46 (H.W.).
- Tinodes waeneri* L. Dauk Ghyll, Horton-in-R., 29/6/42 (W.D.H.) ; Goathland, 6-15/7/46, God's Bridge, Chapel-le-Dale, 26/8/46 (H.W.).
- Psychomyia pusilla* F. Cowthorpe, 3/8/42 (W.D.H.).
- Philopotamus montanus* Don. Holmehouse Wood, near Keighley, 13/9/41, 30/5/42, 6/9/42, 20/3/43, 7/8/43, 26/3/44, 15/4/44 (J.W.) ; Brans Ghyll, Horton-in-R., 30/6/42, Ling Ghyll, Horton-in-R., 2/7/42, Horton-in-R., 1/7/42 (W.D.H.).
- Wormaldia occipitalis* Pict. Holmehouse Wood, near Keighley, 12/10/43 (J.W.).
- Chimarra marginata* L. Boroughbridge, 23/7/45 (W.D.H.).
- Rhyacophila obliterata* McLach. Holmehouse Wood, near Keighley, 19/9/42, 20/8/43, 18/9/43 (J.W.).
- Glossosoma boltoni* Curt. Cowthorpe, 3/8/42, Brans Ghyll, Horton-in-R., 30/6/42 (W.D.H.).
- Agapetus fuscipes* Curt. Dauk Ghyll, Horton-in-R., 29/6/42, God's Bridge, Chapel-le-Dale, 26/8/46 (H.W.).

**Coleoptera** (G. B. Walsh) : The general opinion seems to be that this has been an exceptionally poor year for collecting beetles. This is doubtless due in large measure to the wet, cold, sunless summer, which is only the latest in a succession of such summers. However, a number of members have put in some hard work and there are some interesting records. We would like specially to thank Derek Appleyard, Brian Eaton, Peter Macvicar and Kenneth Varley, of Coldcotes Secondary Modern Senior Boys' School, Leeds, for their records, and hope these will stimulate them to further keen work.

There are six new county records :

- Philonthus binotatus* Ljungh., taken at North Cave by G. B. Walsh, but apparently not previously recorded.
- Synchita humeralis* Fab. (*juglandis* Fab.). One specimen taken by Mr. W. D. Hincks in Askham Bog (1/6/46) ; this is the most northerly record, the previous one being Sherwood Forest.
- Eurythyrea austriaca* L. Caught flying at Oakwood, Leeds, by P. Macvicar. This buprestid is an introduction from the Continent.
- Phaedon regnianum* Tott. Taken at Welwick (9/6/46) by Mr. W. D. Hincks on *Cochlearia anglica*, on which it was common. This has previously been recorded only from the extreme south-east of England.
- Platyrhinus resinosus* Scop. One specimen taken in 1945 in Askham Bog by Mr. T. B. Kitchen.
- Dirhagus pygmaeus* F. Swept from bracken at Pickering (A. Smith).
- Other interesting records are the following :
- Feronia (Pterostichus) angustata* Duft. Mr. J. H. Flint reports that since its first capture at Middleton, Leeds (V.C. 63), 20 specimens have been taken. He has also taken it in V.C. 64 on burnt ground at Eccup, one specimen on June 27th, 1946, and two the following day.
- Dromius sigma* Rossi. Specimens have been taken by several members at Askham Bog.
- Notiophilus rufipes* Curt. One specimen at Wentbridge (J. H. Flint).
- N. biguttatus* Fab. A specimen taken at East Keswick (J.H.F.) had two pores on interstice, four on the right elytron.
- Asaphidion flavipes* L. Oakwood, Leeds (D. Appleyard).
- Dromius notatus* Steph. Spurn, June, 1946 (W.D.H.).
- Trogophloeus holophilus* Kies. Welwick, June, 1946 (W.D.H.).
- Acidota cruentata* Mann. Oakwood, Leeds (B. Eaton and P. Macvicar).
- Halplus wehnckei* Gerh. }  
*H. heydeni* Weh. } Gateforth, March, 1945 (J. R. Dibb).  
*Rantus grapii* Gyll. }
- Dryops ernesti* Des Gozis. Ingleton, September, 1945 (J.R.D.).
- Ernobius mollis* Linn. Roundhay, Leeds, May, 1945 (J.R.D.).
- Platycis minuta* (F.). A pair in cop., Mulgrave Woods, September, 1946 (A. Broadbent).

*Cryptocephalus hypochaeridis* Suffr. Pickering (A. Smith).

*Thanasimus formicarius* L. In numbers on pine at Allerthorpe (A.S.).

*Cryptohypnus maritimus*. In many places on the River Swale between Richmond and Morton (B. S. Cooper).

*Melasis buprestoides* L. Askham Bog, 15/6/46 (W.D.H.).

*Melandrya caraboides* L. Bred from pupa in oak stump at Thornton-le-Dale, 30/4/46 (W.D.H.).

*Monotoma testacea* Mots. One specimen at Wentbridge (J.H.F.).

*Brachysomus echinatus* Bon. One specimen, East Keswick (J.H.F.).

*Tetropium gabrieli* v. *crawshayi* Sharp. Common under pine bark at Thornton-le-Dale, 30/4/46 (W.D.H.).

The other records will be published later.

In conclusion we should like to express our sympathy with Mr. E. G. Bayford on his illness, and to wish him a complete recovery.

**Hymenoptera** (W. D. Hincks) : It is almost unnecessary to state that the past disastrous season of high rainfall and little sunshine had a marked effect on the numbers of Hymenoptera, an order so predominantly sunloving and depending so much on optimum climatic conditions. Particularly marked was the effect on the bees and wasps amongst Aculeates, and the following report from Mr. T. S. Beardmore, of the Leeds Beekeepers' Association, in regard to the Honey Bee (*Apis mellifera* L.) will be of special interest.

Beekeepers will long remember 1946—the worst season in years. Reports from reliable sources say nothing has been seen as bad in 35 years, and for heather honey, since 1888. Bee colonies built up well in early spring but received a severe check in the almost wintry conditions of May and June with the result that breeding almost ceased. When the local nectar flow arrived in early July, most colonies were unable to take advantage of it owing to diminished populations. Breeding did, of course, re-commence at this time and stocks increased rapidly in population on the July flow. When we took our bees to the heather in early August, they were certainly in prime condition to gather bumper crops—if only the weather had been kind. Many beekeepers lost stocks owing to starvation—in some parts of Yorkshire losses have been as high as 33½ per cent. Those that survived arrived back at the home apiaries with little or no winter stores and without brood. It is certain that many stocks will perish 'ere spring is here again because they go into winter rest with populations of old bees, no late breeding having taken place. In most cases, they are also being wintered on stores of sugar syrup, much of which, in the case of stocks which were away at the heather, will be unsealed owing to late feeding and may later ferment and give rise to dysentery. The outlook for 1947 does not appear to be bright and in some districts the fruit crops, where these depend on hive bees for pollination, will be seriously affected.

The parasitic families are somewhat less dependent on weather conditions which, nevertheless, hampered their collection by often rendering sweeping impossible. Consequently only very minor collections were made on most of the Union's excursions, including those to Spurn, Askham Bog, Thorne, Ilkley and Sandsend. Perhaps the scarcity of larger forms had the effect of concentrating attention on the smaller Chalcidoid families, for these were collected in fair numbers on several occasions. Unfortunately this material is particularly difficult to identify satisfactorily and much of it must stand over for the present. However, it is pleasing to be able to announce the capture of two species of Fairy Flies (Mymaridae) new to the British list. These are noted below and will be dealt with in greater detail in a contribution to one of the entomological journals shortly.

Ichneumonidae were particularly disappointing this year and very little of special interest was obtained. In the Leeds area at least, Sawflies were very scarce, even common species being rare or entirely absent. I understand that Mr. Wood has had a fair season in this section at Keighley. Mr. J. M. Brown sends the following report on the Sawflies of the Robin Hood's Bay district.

'This has been another poor season and Sawflies (as other insects) have been anything but plentiful in this district. My earliest was *Dolerus anthracinus* on April 1st. Other *Doleri* taken include *D. cothurnatus* on May 22nd, *D. rugosulus* on May 15th, *D. picipes* May 29th, *D. gonager* May 28th, *D. puncticollis* on June 7th and *D. nigratus* on June 13th. *Blennocampa geniculata* and *Empria alector* again



occurred in the same hedge-bank as last year on meadowsweet on April 25th to 28th (with apparently a very short season). *Athalia bicolor* as last year was present in buttercup flowers on June 18th. *Tenthredo arcuata* was first noted on May 23rd, *T. perkinsii* on May 28th, and *T. sulphuripes* on June 9th. *T. vespa* was in the garden on July 3rd and 5th. *Emphytus cinctus* on April 22nd, was the only species seen on the rose, and *Stromboceros delicatulus* the only bracken species taken on June 7th. *Pteronidea ribesii* was in the garden on June 19th, *Priophorus eradiatus*, June 12th, and *Pristiphora ruficornis*, June 16th, on hawthorn. The only species new to this district is *Priophorus varipes*, taken on June 16th on hawthorn.

Mr. A. E. Winter has taken some excellent photographs of the Braconid parasites of greenflies during the year and has bred *Dyscritulus planiceps* (Msh.) from 'Shirt-button' cocoons taken at Scotton Banks, Knaresborough, in August and Robin Hood's Bay in September. Dr. G. Voigt paid particular attention to leaf-miners in the Leeds district thereby providing some interesting sawfly records.

Fewer opportunities than usual for systematic work occurred during the year so that the following list of additions, usually swollen by late records of previous seasons collecting, is a small one. It is restricted to new county (18) and vice-county (14) records with the addition of a few other interesting captures.

Thanks are due to Mr. Wood for his continued help in collecting material ; to Mr. T. S. Beardmore for the data on the Honey Bee ; to Mr. J. M. Brown and Mr. A. E. Winter for records, and to Messrs. A. W. Stelfox and G. J. Kerrich for assistance in the determinations.

## SYMPHYTA

- Arge ustulata* (L.). Welwick, V.C. 61, 9/6/46, W.D.H.  
*A. cyaneocrocea* (Forst.). Welwick, 9/6/46, common on Umbelliferae, W.D.H.  
 \**Perineura rubi* (Pz.). Ramsdale, V.C. 62, 7/6/46, ♀ J.M.B.  
 \**Scolioneura betuleti* (Klug). Hawksworth, Leeds, V.C. 64, leaf-mines on alder, G.V.  
 \**Metallus pumilus* (Klug). Meanwood, Leeds, V.C. 64, leaf-mines on bramble, G.V.  
 †*M. gei* (Brischke). Grassington, V.C. 64, leaf-mines on *Geum*, G.V.  
 †*Profenusa pygmaea* (Klug). Hawksworth, Leeds, leaf-mines on oak, G.V.  
 †*Fenusa pusilla* (Lep.). Hawksworth, Leeds, leaf-mines on birch, G.V.  
 †*Fenella nigrita* Westw. Meanwood, Leeds, leaf-mines on *Potentilla*, G.V.  
 \**Heterarthrus vagans* (Fall.). Meanwood, Leeds, leaf-mines on alder, G.V.  
 \**H. aceris* (MacL.). Hawksworth, Leeds, leaf-mines on sycamore, G.V.  
 †*H. microcephalus* (Klug). Hawksworth, Leeds, leaf-mines on *Salix*, G.V.

## BRACONIDAE

- \**Bracon epitriptus* Msh. Welwick, 9/6/46, W.D.H.  
 \**Euphorus pallipes* (Curt.). Spurn, V.C. 61, 8/6/46, W.D.H.  
 †*Panerema inops* Msh. Forge Valley, V.C. 62, 16/9/46, 2♀♀, W.D.H.  
 †*Trioxyx heraclei* (Hal.). Welwick, 9/6/46, W.D.H.  
 †*Aphidius sonchi* Msh. Spurn, 8/6/46 ; Welwick, 9/6/46, W.D.H.  
*Praon volucre* (Hal.). Scotton, Knaresborough, V.C. 64, cocoons numerous, 2/6/46, until 2/8, after this date host and parasite scarce. Host *Hyalopterus arundinis* (F.). A. E. Winter.  
 †*P. flavinode* (Hal.). Newsholme Dene, V.C. 63, 4/8/44, ♀, J. Wood ; Skipwith, V.C. 61, 22/4/46, ♀, W.D.H.  
*Dyscritulus planiceps* (Msh.). Scotton, Knaresborough, cocoons on sycamore, 11 and 17/8/46, emerged 23, 24 and 31/8/46 ; Robin Hood's Bay, V.C. 62, Thorpe, 17/9/46, cliffs, 19/9/46, cocoons, A. E. Winter.

## ICHNEUMONIDAE

- †*Hemiteles hemerobii* Pfan. Burnsall, V.C. 64, 10/43, cocoons of *Kimminsia subnebulosa* (Steph.), under bark, emerged 28/4/44, 1♀, 26/5/44, 1♀, 31/5/44, 1♀, W.D.H.  
 Roundhay Lime Hills, Leeds, V.C. 64, 11/1/46, cocoons of *K. subnebulosa*, emerged 20/3/46, 1♀, W.D.H.  
 \**Cryptus laborator* (Thunb.). Welwick, 9/6/46, W.D.H.  
*Hygrocryptus carnifex* (Grav.). Askham Bog, V.C. 64, 17/5/46, W.D.H.  
*Rhyssa persuasoria* (L.). Robin Hood's Bay, on larch post, 4/6/46, ♂♀, J. M. Brown.

## CYNIPIDAE

- †*Anacharis typica* Walk. Burnsall, 10/43, cocoons of *K. subnebulosa*, emerged 1944 ; Rounday Line Hills, Leeds, 11/1/46, cocoons of same host, emerged 25/3/46, W.D.H.

## CHALCIDOIDEA

- †*Macroneura vesicularis* (Retz.). Thorne, V.C. 63, 3/8/46, 1♀, W.D.H.  
 †*Aphelinus abdominalis* (Dalm.). Seckar Wood, V.C. 63, 3/7/43, W.D.H. ; Hebden Bridge, V.C. 63, 20/7/45, W.D.H. ; \*Brayton, Selby, V.C. 64, 23/6/44, W.D.H. ; Ilkley, V.C. 64, 6/7/46, W.D.H. ; \*Forge Valley, V.C. 62, 16/9/46, ♂♀, W.D.H.

## MYMARIDAE

- †*Polynema gracile* (Nees) (*ovulorum* auctt.). Askham Bog, 1/6/46, ♂, 7/9/46, 3♀♀, W.D.H.  
 †*P. fumipenne* (Hal. in Walk.). Askham Bog, 5/10/46, 2♀♀, W.D.H.  
 †*P. longulum* Foerst. **New to Britain.** Keighley, Holmehouse Wood, 16/9/44, ♂, J. Wood ; \*Askham Bog, 27/7/46, ♂, 7/9/46, ♀, 5/10/46, 3♀♀, W.D.H.  
 †*Ooctonus vulgatus* Hal. Askham Bog, 5/10/46, ♀, W.D.H.  
 †*O. heterotomus* Foerst. **New to Britain.** Askham Bog, 7/9/46, 2♀♀, 5/10/46, ♂♀, W.D.H.  
 †*Lymaenon litoralis* (Hal.). Welwick, 9/6/46, W.D.H.

## ACULEATA

- \**Bethylus cephalotes* (Foerst.). Spurn, V.C. 61, 8/6/46, W.D.H.  
 \**Spilomena troglodytes* (Lind.). Shipley, V.C. 63, 31/8/46, W.D.H.

**Hemiptera** (J. M. Brown) : **HETEROPTERA.** There is very little of interest to report as the result of a poor season. Species taken at Robin Hood's Bay include *Kleidocerys* (= *Ischnorhynchus*) *ericae* Horv., on heather, 10/7, 16/8 ; *Rhopalotomus ater* L., among grass, 20/7 ; *Heterocordylus leptocerus* Steph., *Anthocoris sarothamni* D. & S., and *Orthotylus virescens* D. & S., on broom, 20/7 ; *Dicyphus epilobii* Reut., on willow-herb, 6/8 ; *D. pallidicornis* Fieb., on foxglove, 21/8 ; *Capsus merioterus* Scop., 21/8 ; *Campyloneura virgula* H.S., on oak, 28/8 ; *Malacocoris chlorizans* Fall., on hazel, 29/8, 6/9 ; *Lygus pabulinus* L., and *L. pratensis* L., occurred on garden rasps. \**Corixa scotti* Fieb. (new to V.C. 62) occurred in a pool on the moors.

Mr. H. Whitehead took *C. nigrolineata* Fieb. and *C. praeusta* Fieb. at Osmotherley, and Mr. W. D. Hincks reports *Gampsocoris punctipes* Germ., from Spurn, 8/6, and *Zicrona caerulea* L., from near Egton Bridge, 17/9.

**Homoptera** : The following occurred at Robin Hood's Bay. *Cixius nervosus* f. *fasciatus* Fieb., 5/9 ; *Euacanthus interruptus* L., 24/8 ; *Typhlocyba tenerrima* H.S. was abundant on garden rasps, 7/8 ; *Conomelus limbatus* Fal., 16/8 ; *Jassus mixtus* Fab., 24/8 ; and the following forms of *Philaenus leucophthalmus* L. occurred in the garden, chiefly on Chrysanthemums, *spumarius* L., *lateralis* L., *vittatus* Fab.

**Neuroptera** (J. M. Brown) : Few have been observed. *Panorpa germanica* L. still remains the only species of the genus seen at Robin Hood's Bay. *Chrysopa ventralis* Curt. occurred, 5/7.

**Psocoptera** (J. M. Brown) : The common species seemed to be about in their usual numbers and the only one worth noting is the comparatively large *Psocus nebulosus* Steph., 24/8.

**Orthoptera** (J. M. Brown) : Grasshoppers have been exceptionally scarce about Robin Hood's Bay, and very few of even the usually common species, *Chorthippus bicolor* Charp. and *Omocestus viridulus* L., have been noticed, though Mr. W. D. Hincks records the former species as common in the Leeds district all the season. Other records noted by Mr. Hincks are *Chorthippus bicolor* Charp., Forge Valley, 16/9, Thorne, 3/8, Sandsend, 15/9, Arncliffe Woods, 17/9, near Egton Bridge, 17/9 ; *C. parallelus* Zett., near Egton Bridge, 17/9 ; *C. albomarm-*

*ginatus* DeG., Welwick, 9/6 ; *Omocestus viridulus* L., Thorne, 3/8 ; *Tetrix vittata* Zett., Mulgrave, 15/9. Mr. Hincks also reports that a large immature female Katydid was imported into a Leeds shop in bananas.

**Plecoptera** (J. M. Brown) : The only species seen at Robin Hood's Bay are the usual ones which have frequently been recorded before. Mr. H. Whitehead sends in the following records for the season. *Chloroperla torrentium*, Goathland, 6-15/7/46 ; *Leuctra inermis*, Goathland, 6-15/7/46 ; *L. fusciventris*, very common, Chapel-le-Dale, 25/8/46, Kingsdale, 27/8/46 ; *Protonemura meyeri*, Goathland, 6-15/7/46 ; *Nemoura variegata*, Bramhope Ponds, Leeds, 22/6/46.

**Ephemeroptera** (John R. Dibb) : There are no new additions to the vice-county check list this year, the best capture reported being the under-mentioned, *Baëtis scambus* Eaton, a third record for V.C. 64. The season appears to have been rather poor for Mayflies, more particularly in the comparative absence of large swarms which usually follow mass hatchings. This has probably been due to the lack of sufficiently long periods of bright, warm weather during the summer and autumnal seasons, causing the times of hatching to be more frequent and evenly spread, rather than the conditions which bring about the hatching of huge numbers upon the same day. The year's weather has similarly largely discouraged the dancing swarms and it will be interesting to see what effect the results of the weather conditions will have upon the Mayfly population of the next generation.

The detailed recording of the numbers and species of Mayflies and the times of their occurrence in a particular locality, together with full accounts of the day to day meteorological conditions, taken over a period of four years (to allow for the maturing of the species with long nymphal stages) would provide the answer to many of the questions which arise in the presentation of these reports year after year. This is just one example of the type of work still awaiting the attention of the ephemeropterist who is prepared to specialise in field work.

Attention is here drawn to the latest British list of the Ephemeroptera which forms part of the Check List of British Insects recently published under the authorship of Kloet and Hincks, who are to be congratulated for standardising the presentation of the lists of all the orders of British Insects in one volume, as well as for including so much information in addition to the names of all the known British species. For example, the inclusion of genotype designation where known.

Mr. J. Wood reports seeing fair numbers of adults during the year.

I am indebted to Messrs. Whitehead (H.W.) and Hincks (W.D.H.) for the records of those species listed below, which are not otherwise acknowledged.

*Ephemerella ignita* Poda. ♂, Goathland, 6-15/7/46 (H.W.).

*Baëtis bioculatus* Linn. Ilkley, 6/7/46 (W.D.H.).

*B. scambus* Eaton. Ilkley, 6/7/46 (W.D.H.).

*B. rhodani* Pict. Seven Arches, Leeds, 7/46 (J.R.D.).

*B. pumilus* Burm. Kingsdale, Ingleton (1,000 ft.), ♂♂, 27/8/46 (H.W.).

*Centroptilum pennulatum* Eaton. Ilkley, 6/7/46 (W.D.H.).

*Procladius rufulus* Mull. Ilkley, 6/7/46 (W.D.H.).

*Heptagenia lateralis* Curt. ♂♀, Kingsdale, Ingleton, 27/8/46 (H.W.).

*Ecdyonurus venosus* Fab. ♂♂, Kingsdale, Ingleton, 27/8/46 (H.W.).

**Diptera** (Chris. A. Cheetham) : 1946 must go down as the worst on record from the dipterist's viewpoint. I have few interesting facts to recall. A visit to the foot of Cautley Spout on March 27th produced an unexpected species, *Tipula macrocera* Zett., an insect found at high altitudes. Edwards found it abundant above 3,000 ft. in Scotland in June. I get it on most of our Yorkshire mountains during the summer, but at Cautley it was at 600 ft. O.D. However, I had caught it on April 14th, 1935, in Crummackdale at 800 ft. O.D.

On Austwick Moss, March 30th, *Chilosia grossa* Fln. was plentiful on the willows and alongside the ditch *Dicranota bimaculata* Schm. was ovipositing in numbers. *Norellia spinimana* Fln. caught on June 25th was new to the Austwick district and so was *Xiphura nigricornis* Mg. on June 15th I was glad to find that *Nephrotoma dorsalis* F. is still at Wistow though the ponds are being used as a rubbish dump. The single fine day at Welwick at Whitsuntide added two species to the Yorkshire



list, *Rhamphomyia spissirostris* Flin. and *Chamaemyia (Ochtiphila) juncorum* Flin. *Hydrophorus litoreus* Flin. which I only know from Helwith Moss and two species of *Tipula*, *vernalis* Mg. and *paludosa* Mg., though common everywhere are not recorded for V.C. 61.

At Ainderby, *Aedes annulipes* Mg. had not been recorded previously in V.C. 65. Though few flies were taken on the wet trip to Thorne, three, *Gymnopternus aerosus* Flin., *Chrysogaster solstitialis* Flin. and *Echinomyia grossa* L. were additions to V.C. 63. At Robin Hood's Bay the most interesting were *Stratiomys potamida* Mg., *Phaonia errans* Mg., *Ectomus alpinus* Hal., and *Campsicnemus curvipes* Flin. At Ilkley, *Porphyrops riparia* Mg. was new to the county list.

**Arachnida** (A. C. Braham) : In the sphere of arachnology the year, notwithstanding the adverse climatic conditions, has been a reasonably prolific one, and whilst little work has been done by the recorder on either the Acari or Opiliones, field work on the order Araneae has resulted in the collection of ninety-six specimens comprising some thirty-four different species. Most of the year's collecting was carried out in the numerous woods in and around Huddersfield and also at Thorne Waste, near Doncaster, and the method of capturing specimens was almost entirely confined to individual tubing since sweeping was rendered almost impossible owing to the habitually wet conditions of the vegetation. All the specimens were captured and brought home alive where they were later killed, mounted and pickled, with the exception of a few which were kept alive for the purposes of study. These were confined in glass cages of special construction, and afforded many hours of absorbing interest, especially when spinning, laying eggs, or capturing their food, which invariably consisted of flies (*Musca domestica*). Amongst those kept alive for study were specimens of the following species : *Ciniflo fenestralis*, *Segestria senoculata* and *Tegenaria domestica*.

A complete list of the spiders collected during the year and classified into families is as follows :

LYCOSIDAE : *Lycosa lugubris* (Walck.), *L. saccata* (Linn.), *L. monticola* (Sund.).

THERIDIIDAE : *Theridion redimitum* (Linn.), *T. vittatum* (C.L.K.), *T. notatum* (Linn.), *Stearodea bipunctata* (Linn.).

ARGYROPIDAE : *Meta reticulata* (Linn.), *Cyclosa conica* (Pall.), *Aranea diadema* (Linn.), *A. reaumuri* (Scop.), *A. raji-betulae* (Sulz.), *A. sturmi* (Hahn.), *A. sexpunctata* (Linn.).

CLUBIONIDAE : *Clubiona comita* (C.L.K.), *C. subtilis* (L.K.).

SALTICIDAE : *Salticus scenicus* (Linn.), *Sitticus pubescens* (Fabr.).

LINYPHIIDAE : *Linyphia resupina*-dom (De G.), *L. montana* (Linn.), *L. peltata* (Wid.), *Bolyphantes alticeps* (Sund.), *Lepthyphantes minutus* (Bl.), *Porrohomma errans* (Bl.).

DICTYNIDAE : *Ciniflo ferox* (Walck.), *C. fenestralis* (Stroem.).

THOMISIDAE : *Xysticus viaticus* (Linn.), *Philodromus dispar* (Walck.).

AGELENIDAE : *Tegenaria domestica* (Linn.).

DRASSIDAE : *Drassodes lapidosus* (Walck.), *D. silvestris* (Bl.), *Scotophoeus blackwalli* (Thor.).

TETRAGNATHIDAE : *Tetragnatha extensa* (Linn.).

DYSDERIDAE : *Segestria senoculata* (Linn.).

## BIOLOGY

**Freshwater Biology** (H. Whitehead) : Mr. J. M. Brown writes : In last year's report it was stated that the *Corixa* fauna of certain wayside pools in the Robin Hood's Bay area appeared to be stable. In the case of Pool 'A' this statement must be extended and amended. This pool was, until recently, inhabited by countless numbers of *Corixa* of two species, *C. lateralis* Leach and *C. nigrolineata* Fieb., but during the last two seasons conditions have apparently changed, and the pool has been invaded by duckweed (*Lemna minor*), and at present there is an almost continuous surface covering. In order to observe whether this had produced any effect on the *Corixa* fauna, and especially to see if any fresh species had colonised, two visits were paid (August 24th and October 29th). Far from discovering additional species, no examples of even the two original very plentiful ones could be obtained ! The pool seemed to have been deserted by the



*Corixa*. Can the presence of the *Lemma*, either directly or indirectly, be held responsible?

Beyond the above interesting note there is little to report. A few specimens of winged aquatic insects have been taken and these are given in the sections of this Annual Report devoted to Trichoptera, Plecoptera and Ephemeroptera.

## INCOME & EXPENDITURE ACCOUNT

Year ending October 19, 1946.

INCOME.				EXPENDITURE.			
	£	s.	d.		£	s.	d.
Life Members' Payments	...	...	34 13 0	Secretary's Stationery	...	...	3 4 10
Members' Subscriptions—				Secretary's Cash Expenses	...	...	16 4 0
Arrears	10	6	7	Excursion Circulars	...	...	41 9 9
Current	63	10	6	Members' Cards	...	...	13 12 6
Advance	2	13	6	Annual Report	...	...	3 10 0
			76 10 7	Sundry Printing	...	...	1 3 5
Levies from Affiliated Societies—				Transactions	...	...	133 10 0
Arrears	1	1	3	Reprints	...	...	1 19 9
Current	8	8	5	Renting of Rooms, etc.	...	...	2 18 0
			9 9 8	Treasurer's Cash Expenses	...	...	1 13 8
4% Consols. B. of E. (£200)	8	0	0	Bank Charges	...	...	0 8 0
4% Consols. P.O. (£150 10 11)	6	7	6	Naturalist—			
			14 7 6	Naturalist to Members	162	1	6
Booth Fund	...	...	3 10 0	Naturalist Exchanges	3	16	1
Cheeseman Fund	...	...	3 10 0	Binding	...	...	1 0 0
Naturalist Subscriptions—				Extra Illustrations	...	...	26 0 0
Arrears	19	10	0	Extra Pages	...	...	32 11 0
Current	118	0	0	Editor's Postages	...	...	9 8 4
Advance	5	10	0				234 16 11
			143 0 0				
Sale of Publications	...	...	25 9 11				
Donations	...	...	30 0 0				
Bequest (late W. J. Clarke)	...	...	100 0 0				
Discounts	...	...	10 9 3				
Credits	...	...	0 10 3				
Balance of Expenditure over Income	...	...	3 0 8				
			£454 10 10				£454 10 10

## BALANCE SHEET, October 19, 1946.

LIABILITIES.				ASSETS.			
	£	s.	d.		£	s.	d.
Booth Fund £100 3½% Conversion	...	...	100 0 0	Cash at Bank	...	...	193 17 3
Cheeseman Fund £100 3½% War Stock	...	...	100 0 0	Investments—			
Life Members' Fund	...	...	450 9 0	£200 4% Consols	...	...	200 0 0
Cash due to Editors	...	...	3 12 5	£159 10s. 11d. 4% Consols	...	...	159 10 11
Subscriptions paid in advance	...	...	8 3 6	£100 3½% Conversion	...	...	100 0 0
Balance due to Treasurer	...	...	26 17 6	£100 3½% War Stock	...	...	100 0 0
Balance of Assets over Liabilities	...	...	86 15 9	Subscriptions unpaid	...	...	45 0 0
				Subscriptions written off	...	...	22 10 0
							22 10 0
edited and found correct,				S. D. P. FISHER, Treasurer.			
JOHN R. DIBB,				LINDSAY M. ANDERSON,			
W. D. HINCKS,			£775 18 2	Asst. Treasurer.			£775 18 2
27th October, 1946.							

The above accounts show the total amounts received by the Treasurers and the total amounts paid out by them. They also show the total balance of assets over liabilities after every known debt has been accounted for. The Income and Expenditure Account includes sums peculiar to the current year. On the Income side Life Members Subscriptions £34 13s. 0d and a bequest £100, also on the Expenditure side £133 for *Transactions*.

## BOOK REVIEWS

**British Game**, by **Brian Vesey-Fitzgerald**, pp. 240, with 21 colour and 81 monochrome illustrations. Collins—*The New Naturalist* series, 16/-. This book is comprehensive and good value. Under the title *British Game*, the eight game-birds (including the Quail) are dealt with in 68 pp.; the Swans, Geese and Ducks, in 55 pages, with a chapter entitled "The Numbers of Wildfowl;" the Waders in 29 pages; "Ground Game and Various," in 11 pages and Deer in 18 pages. The last 30 pages cover "The Preservation of Game," with chapters on "The Enemies of Game," on "The Gamekeeper," and a final short chapter, in which the treatment by the latter of the former is discussed and advice given concerning control—not extermination—of predators and of species less predatory than many gamekeepers still suppose. We are grateful for the word "sacrosanct" used by the author concerning the buzzards and all owls, "with the possible exception of the Little Owl;" and for the inclusion in the list of species that no gamekeeper should shoot of Kestrel and Hobby, of Osprey and Eagle, Kite and all the harriers—"the only problem here is one of preservation, not reduction. Man can destroy a species: he cannot make one"; the man who shoots or traps any rare bird or animal "is nothing more than an ignorant and murderous lout." This is a book written about game, by a game-preserver, who combines with his sporting proclivities a sound and varied knowledge of field natural history, as we of *The Naturalist* know from his contributions in past years concerning the British Bats. The book can safely be recommended for presenting to game-preservers and gamekeepers.

Mr. Vesey-Fitzgerald writes well, as befits a past editor of *The Field*, from far more extensive experience of game-birds than I possess. Consequently, for expert advice, I loaned my review copy to a game-preserving friend, who remarked, after reading the book, "This man knows what he is writing about; I have ordered five copies." The author is equally sound in the chapters dealing with ducks and waders although the statement that except in parts of Scotland the Goosander is only a winter visitor, overlooks the recent breeding records in Northumberland. One wonders where the Long-eared Owl is "becoming more numerous," in view of its increasing scarcity in northern England. And incidentally, one suspects that in a list of plants "supposed to be rabbit-proof," *sea blackthorn* is a misprint for *sea buckthorn*.

Such minor matters do not affect the fact that the book presents a large variety of accurate information that will be useful for many of us to have in one volume. The illustrations, by well-known artists and photographers, are so well reproduced as to form a collection alone well worth the price of the book. If I had to pick one of them for looking at again and yet again, it would be the lovely picture by the late George Kearney of a Scottish Mountain Hare sheltering in a January snowdrift.—R.C.

**Britain's Structure and Scenery**, by **L. Dudley Stamp**. Pp. 255, with 47 colour and 40 monochrome photographs and 74 maps and diagrams. Collins, 16/-. As the widely-varied floras and faunas of different regions of Britain are largely determined by geological and topographical features, this latest addition to the *New Naturalist* series forms an invaluable background to the whole series. In it Dr. Stamp traces the past geological history of the British Isles with special reference to its bearing on present-day physical features and scenery. No comparable area in the world has such a complex history and the necessity of unfolding the intricate story with a minimum of technicalities and within the prescribed limits of length must have imposed a severe test on the author. Though the academic geologist may doubtless find room for disagreement with some aspects of the treatment the general presentation is as praiseworthy as it is interesting. The longer first part of the book deals with the build of Britain, commencing with a simple geological introduction, followed by illustrations of the work of rivers and the sea in determining scenic characteristics and the geological analysis of land forms and topography in sedimentary and volcanic country. The chapters dealing with the Ice Age and the effects of glaciation are particularly clear and include an account of the contributions of botanical research on pollen analysis to the reconstruction of post-glacial history. The longest and most difficult chapter to assimilate traces the involved geographical evolution of Britain through the ages. The inclusion of a chapter on soils is a welcome feature. The second part deals with the salient physical features of different contrasted regions. The treatment of each is, of necessity, brief; the North of England, the Lakes and the Pennines get four pages only, and Scotland,

Wales and Ireland are each dealt with in one short chapter. The book is generously illustrated with photographs, diagrams and maps, but the arrangement of the plates is a perpetual source of irritation. Coloured plates of Welsh scenery, for instance, are eventually to be found in the chapter devoted to English Scarplands; and of Devon and Cornwall in the chapter on East Anglia and the Fens, and so on throughout the book. As no page references to their positions are given in the text, and the matter is further and unnecessarily complicated by the use of separate Latin and Arabic numerals for the coloured and uncoloured plates, the general arrangement could scarcely be more exasperatingly inconvenient. Apart from this the volume is an excellent addition to this admirable series.

**More Birds of the Day**, by Eric Hosking and Cyril Newberry. Pp. 128 with 84 plates from the authors' photographs. Collins, 12/6. This is a very worthy volume to succeed the authors' *Birds of the Day* and *Birds of the Night*. In this latest book, thirty-two more species are dealt with. The list is quite a miscellaneous one, but this is no drawback in a work which does not set out to be systematic. The reader will expect photography of a high order and he will not be disappointed. Each successive book by these indefatigable authors seems to reach yet a higher level of technical achievement. The photographs are not mere portraits of birds. Every picture brings out some special point which is usually referred to in the descriptive title. There are four plates of the Wryneck and these are accompanied by a most informative short article, which contains a detailed account of the feeding habits of this uncommon species. There are no less than eleven photographs showing successive stages in the ejection of the eggs of a Meadow Pipit by a nestling Cuckoo. These two examples must suffice to indicate the authors' choice of illustrations, but all the photographs are excellent examples of really valuable records of bird life. The book is very cheap in these days of high prices.

**The Country Diary of a Cheshire Man** by A. W. Boyd. Pp. 320, with 15 photographic illustrations. Collins, 12/6. An excellent record of twelve years close and intelligent observation, this book will prove of interest to all students of nature and particularly of birds, though Mr. Boyd presents a knowledge above the average about botany and entomology. That the author is an ornithologist of unusual merit is evident, not so much by his descriptions of the rare vagrants he has noted in his home county and elsewhere—and some may say he has seen more than his share—but by the very clear recording of the ordinary and intimate day-to-day happenings in the wild life on and around his farm. The diary is strongly recommended to all who intend to take up seriously the work of a field naturalist; the book well shows the worth of simple observation and the value of the collation of notes over a number of years. There are also points to be borne in mind by "old hands" when taking observations. To any but earnest field workers, the diary may be somewhat monotonous, but relief is given by short descriptions of tours abroad and by accounts of local customs etc., interspersed with humour and anecdote. Yorkshiremen, and particularly Sedberghians, may object to the spelling of the town's name as Sedburgh.—J. P. U.

**Wandering with Nomad**, by Norman Ellison. Pp. 179. University of London Press, 6/-. This is primarily a book for boys of school age and will be very interesting reading for all those who have an inclination to pursue the study of wild life, especially birds. Readers of school age, whom it is hoped to enrol for life in the study of nature, should have statements clearly and correctly presented to them. Unfortunately, in the book under review, this is not always done; for instance, on page 13, Nomad states that 'Owls and birds of prey, eagles and hawks, always kill with their feet.' The capture of the prey may be made always with the feet but may not the *coup-de-grâce* be generally given with the beak? On page 48: 'All the birds of prey swallow their food whole'; owls may swallow whole their capture of beetles and mice, but a sparrow hawk would experience some difficulty with a blackbird! Page 69 records rooks and lapwings as rearing two broods in a year; this procedure is exceptional in both cases. Regarding language, there is far too much beheading of the word 'will' and apostrophising the double 'l' with the preceding word. The instructions to budding observers are good and not too rigid, and the illustrations of birds have been well produced.

J. P. U.



**The Trematoda**, by Dr. B. Dawes. Pp. xvi×644, with 81 text figures. Cambridge University Press, 52/6. The trematodes—or 'flukes' as these organisms are popularly called—are a group of parasitic worms about which little information has hitherto been readily available in this country. The aim of Dr. Dawes in writing this account has been to provide 'in a single volume information that will enable students' . . . to identify the trematode parasites of representative animals from the European fauna and also to provide a broader outline of the structure, mode of life, bionomics and life histories of the animals than can be found in any one book hitherto published in any language.' The book commences by dealing with the general characteristics of 'flat-worms' and then continues with the morphology and life cycles of the three orders of flukes—Monogenea, Aspidogastrea, and Digenea. The revised classification of these orders is dealt with in some detail. The main bulk of the book considers the common parasites of the various vertebrate groups and adequate keys are provided. Other chapters deal with reproduction, larval forms, geographical distribution, phylogeny, physiology and biology. The book concludes with a short historical account of trematode research. There is also an appendix dealing with technique. This excellent reference book for students and non-specialists is well produced throughout and contains a large number of excellent line drawings. The writer has happily kept to the same abbreviations of text-figure lettering throughout and has also used a standard system of shading of internal organs which makes for easy interpretation of the figures. Specialists may regret that more space is not given to detailed histology, staining and mounting technique, and the host-parasite lists, but detailed consideration of these would doubtless have added considerably to the bulk of the book. Although detailed descriptions of the various species are given very fully, in the digenetic trematodes the intermediate host is frequently not referred to, and the reader is left to search the index to see whether the life history is given elsewhere. If—as is often the case—the life history of any particular species is unknown, a note to that effect would have been advantageous. Notwithstanding the lack of detail in certain sections—which will be evident only to specialists—Dr. Dawes has altogether produced a very readable book on trematodes, and university teachers and students attempting to keep track of the many ramifications of their ever growing subject will find it to contain much useful and interesting information.

J. D. S.

**The Monkey Tribe**, by F. Martin Duncan. Pp. 118, with 32 full page illustrations in black and white. Sampson Low, Marston & Co., Ltd., Ludgate Hill, E.C.4. 12/6. The position of the primates in the evolutionary scale has always lent a special interest to the group and an extensive literature about them exists. Details of comparative anatomy and physiology are now probably better known than are the habits and life-histories of these animals. Many years of study of the living animals and the opportunities afforded by his long connection with the Zoological Society of London have made the author peculiarly well fitted for his avowed task of stimulating interest in these remarkable and fascinating creatures. In easy, non-technical language he successfully steers a middle course between the popular account primarily concerned with entertainment rather than instruction and the scientific treatise, in giving an account of the geographical distribution, habits and salient characteristics of upwards of 130 species of the monkey tribe, from the strange little Madagascan *Daubentonia* and East Indian *Tarsius* through the Lemurs, Marmosets, Baboons and Gibbons to the Chimpanzees and Gorillas. Though much information about many of these animals has of necessity been gained through their observation in captivity, many interesting details are given in the form of extracts from writings of explorers and hunters of the habits of the animals in their native surroundings. It is sad to read of the ever-diminishing sanctuary afforded to these as to so many other animals. Civilization has much to answer for and not least the rapid elimination, which has followed upon native 'enlightenment,' of such harmless and uniquely interesting species as the Lemurs of Madagascar, formerly so well protected by tribal traditions and customs. The book gains greatly in interest and value from the admirable illustrations which are the author's own drawings of living animals. If he does not succeed in awakening in the reader a keen interest in the animals he describes, the fault certainly does not lie with the author.



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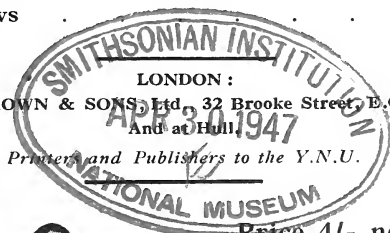
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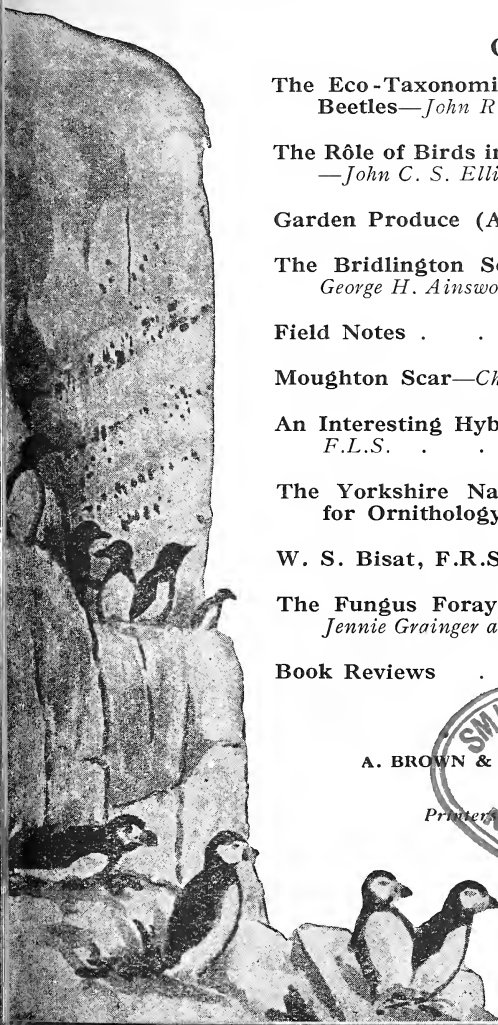
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AN extended excursion of the Section has been arranged from June 13th—23rd, inclusive. Headquarters will be Warren Cottage, Spurn, by kind permission of the Bird Observatory and Ringing Sub-Committee of the Union. Visits will be staggered and limited accommodation is available for about ten persons each night. A circular giving full details of charges, arrangements and programme will be sent to all Members of the Section shortly, but should other entomologists desire to join us the Hon. Secretary of the Section will be glad to forward details. It is hoped to provide interest for both specialists and beginners and there will be excellent opportunities for gaining valuable knowledge and experience. The number that can be accommodated is very limited and it may be necessary to advise would-be visitors of hotel accommodation in the vicinity.

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# THE ECO-TAXONOMIC APPROACH TO THE STUDY OF BEETLES

JOHN R. DIBB, F.R.E.S.

## I. INTRODUCTORY REMARKS.

THE method of approach to the subject by the would-be student of beetles is all important to the production of the Coleopterist, and whether he or she is to be a good or poor product will largely be decided by the kind of plan of action, or lack of one, which regulates the acquisition of the necessary knowledge and experience. In the present discussion we are not concerned with the preparation for a specialised branch of beetle work, but with the provision of sound bases from which we can build for ourselves in specialised directions after gaining a good general knowledge.

To get to know the beetle fauna of a particular district or county entails at least a book knowledge of the beetle fauna of the country in which that smaller area lies. Thus we are confronted at the start with the formidable task of the identification of specimens observed or collected, knowing at the beginning that they will be amongst the 3,690 established species\*, provided the area of investigation lies in Britain. For the purposes of these notes we will assume an interest in the British species.

We must set ourselves three primary aims for 'getting to know' the beetles.

1. To find out where to look.
2. To find out how beetles live.
3. To be able to identify the different species.

Probably owing to the many factors involved in covering the subject adequately, mainly due to the large number of species, it has been the custom in the past to concentrate upon but one of the above aims, with the result that to find out where to look (No. 1 above) has produced the field naturalist who, for the most part, is content to make his observations on country walks and Natural History Society's field meetings. Over a period of years he becomes the experienced field naturalist able to recognise at once the dominant species within the localities with which he has become familiar. He is able to point out much of interest to the younger generation or the new-comer to his district.

Studies of metamorphoses, life histories, or some of the countless aspects of physical development, have led to a large proportion of students becoming wholly concerned with the biological branch of the subject, and this branch is specially attractive to teachers and those responsible for courses upon natural science, because single species, or a part of the life of a single species, can form a circumscribed study for individual students, with no lack of such sectional studies available, however many may be undertaken. Those who spend the whole of their time and energies in finding out how the beetles live (No. 2 above) become the biologists.

To determine the species, subspecies, biological phase, or other category to which a name can be applied, appeals to those who are attracted to the systematics of the science. This entails a study of the order from the aspect of the classification of its component species, and will inevitably require an extension of the knowledge of the representatives of the order found in the home country, to those throughout the world. Thus, to be able to identify the different species (No. 3 above) calls for training in the systematics of the order.

Modern trends, particularly the value of isolating all the factors which impinge upon a species living within its natural environment, have introduced an advanced school of thought arising from this ecological approach to getting to know a species or group of species. The method referred to has been termed the Eco-System. In so far as the practical example which has been chosen here only partially fulfills the idea of the eco-system, it has been deemed advisable to refer to the method outlined as the eco-taxonomic approach.

Hitherto, the student has been almost entirely dependent upon a few standard works for naming his species of beetles, and each of these works has adopted the plan, established by custom, of segregating the species by differences in structure, many of such differences being so highly specialised as to require long training of the student in the details of the anatomy of the many families and genera of the Coleoptera.

\* Check List of British Insects, Kloet & Hincks. (Buncle & Co.) 1945.

In the literature of the last quarter century, however, the tendency has grown towards the presentation of data which combines the names of the species with details of habitat, food plant, plant host and other natural associations connected with the specimens under discussion. The ecological data attaching to British beetles is fast accumulating, but it is only in short notes and articles that it mainly appears, and it is only just reaching the stage of sufficiently covering the British beetle fauna to become of practical help to the student of the Coleoptera. An initial attempt to find the answer to the question of how this mass of information can best be used is discussed below.

The writer, who was residing at Gateforth, near Selby (V.C. 64) during the period December, 1944, to May, 1945, had the opportunity of forming a small collection of the beetles of the area, and with the object of testing the new approach to getting to know the local beetle fauna, adopted the following methods, which may be of interest to fellow students of the order. A description of the work falls under two headings :—

- (a) Field technique.
- (b) The basis for determination.

## 2. FIELD TECHNIQUE.

The primary objective, whilst in the field, is to obtain as much information as possible concerning the natural habitats and the physical conditions surrounding the specimens taken or observed. The exact place of capture and the conditions in which each specimen lives, must be noted, and in view of the fact that a single excursion may result in the capture of perhaps thirty to forty specimens, it is necessary to make a written note about each one whilst in the field. The smaller the number of examples collected and the larger the amount of detail noted about each the better. The above makes it necessary to carry a box containing up to forty small glass tubes so that each specimen can be separately tubed. Each tube should bear a number which is quoted in the field notebook with extended details of capture. One of the more usual forms of large killing bottle can be carried with advantage for those specimens which are so distinctive as to be remembered without requiring a separate container, if so desired.

The type of information required to be noted mainly comes under the following headings :—

- (a) On soil, sand or mud.
- (b) Under stone or other object on ground.
- (c) In water and whether swiftly flowing, slow moving, stagnant or brackish.
- (d) Plant host with name of plant species, genus or general description of plant.
- (e) Position on plant, *e.g.* on leaf, stem, in bark, in wood or at root.
- (f) On flower, blossom, fruit with name of plant.
- (g) In fungi with name of fungus or description and its state of maturity or decay.
- (h) In dung and type.
- (i) In decaying animals and animal matter with type.
- (j) In moss.

Then there are the more general conditions which include geological data, for example the soil and rock formation. The climatic conditions, as well as referring to the actual day conditions, should make reference to the season in the following manner :—

- |            |  |
|------------|--|
| Prevernal. | March to early April up to appearance of earliest flowers. |
| Vernal.    | Mid-April to end of May, trees in young leaf or flower.    |
| Summer.    | June to August, trees in full leaf.                        |
| Autumnal.  | September to November, during leaf fall.                   |
| Winter.    | December to February, most plants dormant.                 |

The nature of the plant communities, or the details of plant ecology of the areas under investigation should be noted, and as an indication of the extent of this section of our work the following list of plant habitats is given as an illustration :—

- |              |                       |
|--------------|-----------------------|
| 1. Oakwood.  | 4. Heath.             |
| 2. Ashwood.  | 5. Heather Moor.      |
| 3. Pinewood. | 6. Cotton-grass Moor. |

- |                 |                  |
|-----------------|------------------|
| 7. Grass Moor.  | 12. Sand Dune.   |
| 8. Grassland.   | 13. Shingle.     |
| 9. Chalk Downs. | 14. Hedgerow.    |
| 10. Marsh.      | 15. Arable Land. |
| 11. Salt Marsh. | 16. Rocky Shore. |
|                 | 17. Mountain.    |

Each of the above plant habitat types presents to the eco-systematist the picture of different kinds of plant associations the details of which should be assimilated by the Coleopterist from a work upon plant ecology\*. The above by no means exhausts the possible habitat descriptions and associations but is an indication only of some of the conditions and situations to be noted in which beetles are found in nature. If we use such habitats, and group the beetles we find in them, we provide ourselves with a classification of habitats, or bionomic key, which divides the total of the species into smaller groups of species. By applying a suitable name to each of these habitat groups we obtain a group name for our captures as soon as they are made. As an example we take some of the habitats listed above for a simplified bionomic key.

## BIONOMIC KEY

- | <i>A. Ground Species—</i>                         | <i>Habitat Group</i>                     |
|---|--|
| 1. Under stones ... ..                            | LAPIDICOLES                              |
| 2. On sand ... ..                                 | ARENICOLES                               |
| <i>B. On or Attached to Plants or Fungi—</i>      |  |
| 3. On tree trunks, in or on wood or bark ...      | TRUNCICOLES, LIGNICOLES,<br>CORTICICOLES |
| 4. On stalks, leaves, flowers ... ..              | HERBICOLES, PHYLLICOLES                  |
| 5. On moss ... ..                                 | MUSCICOLES                               |
| 6. On fungi ... ..                                | FUNGICOLES                               |
| 7. On decaying vegetation, flood refuse, etc. ... | DETRITICOLES                             |
| <i>C. Associated with Animals or Man—</i>         |  |
| 8. In carcases ... ..                             | CADAVERICOLES                            |
| 9. In dung ... ..                                 | STERCORICOLES                            |
| <i>D. Aquatic Species—</i>                        |  |
| 10. In stagnant waters ... ..                     | STAGNICOLES                              |

Consideration of this abbreviated bionomic key will show that it can be greatly extended to cover more and more habitat groups and natural conditions so that as knowledge of the life histories and associations of a larger proportion of species increases and new information recorded, provision can be made for them by erecting new habitat groups as required. The greater the number of accurately defined habitat groups of species, the less becomes the number of species within each and the greater the facility for determination.

Where the association is with a plant, every effort should be made to obtain the name of the plant, and if it is a species unknown to the coleopterist, he should take with him a flower, fruit or leaf for determination by a botanist, making a descriptive note of the general characters of the plant. Beetles which are found in hibernation should be noted as in that condition, for their natural habitat whilst in full activity might be quite different. This discussion being intended to apply to fully adult beetles only, it will be appreciated that in cases where the adult has only just emerged from the pupal stage its situation is often different from that which applies to the imago in full activity. In such cases the recorded habitat will reflect the stage of development.

In order to use the information relating to habitat or host, etc., in the manner described, some experience must be gained in separating the natural habitat from the chance situation, for the possession of the powers of flight by so many species of beetles brings them at times into situations which are both strange and

\* Plant Ecology, by Hilda Drabble (E. Arnold & Co.) 1937.



incongruous. The recurrence of a particular species within the same type of habitat quickly enables the investigator to discriminate between the true natural habitat and the chance situation.

### 3. THE BASIS FOR DETERMINATION

On mounting up the specimens brought back from the field excursion it is necessary to co-ordinate the notes in the field notebook with the specimens to which they apply, and this can be simply done by transferring the number of each specimen, as shown on the tube in which it has been placed, to the card upon which it is mounted. If it should be a pinned specimen then its number can be written upon the locus label, and the date of capture will always be sufficient future reference to the correct batch of field notes (always dated) in the field notebook.

The next problem representing aim No. 3, is to get the material named by the eco-taxonomic method. The collecting of the specimens and the compilation of the ecological notes had been completed in accordance with the foregoing principles, all the specimens having been taken in the Gateforth and surrounding districts. The specimens were then considered one by one together with the appropriate field notes, and worked out with the aid of a bionomic key, on the lines of the one quoted above. (The actual key was a much more extended one covering twenty habitat groups, but space does not allow for the extended scheme to be covered in this paper.) A copy of the latest check list of British beetles (Kloet & Hincks l.c.) had been marked up with numbers opposite every specific name representing the habitat group number of each species, and where a species occurs in more than one of the habitats listed, all the group numbers in which it occurs were quoted. The only species not covered were those marked 'very local,' 'rare,' or 'very rare' in the standard works on British Coleoptera. The habitating of the British species was accomplished from all the available literature on British beetles as well as from the previous records and the past experience of the writer. This was followed by the compilation of separate lists of the species of each habitat group. The collection of specimens was then divided into habitat groups and taken group by group, and with the aid of the appropriate group list of species, was worked out with the standard taxonomic literature.

To bring the system to full development entails the preparation of diagnostic keys to the species providing a separate key for each habitat group. But even without such keys, the advantage to the future student of the beetles, through reducing the mass of species to smaller groups for working out purposes must be obvious. As an experiment habitat group keys have been drawn up and found greatly to facilitate determination, if not always to the species, then to the genus. After due testing these keys will be published for the use of those students interested in this new approach.

To complete our example the records of the species obtained\*, determined and arranged according to the habitat groups given in our illustrative bionomic key, are set out below.

#### Locality Abbreviations :—

Gateforth—(G).

Barlow—(Ba).

Brayton—(Br).

#### HABITAT GROUP—LAPIDICOLES

##### Fam. CARABIDAE

*Cychrus caraboides* Linn. var. *rostratus* Linn. 15/5/45 (G).

*Leistus ferrugineus* Linn. 28/12/44 (G).

*Notiophilus rufipes* Curt. 15/5/45 (G).

*N. biguttatus* Fab. 13/4/45 (G).

*Loricera pilicornis* Fab. 4/1/45 (G).

*Bembidium biguttatum* Fab. 20/3/45 (Ba).

*Harpalus rufitarsis* Dufts. 15/5/45 (G).

*Trichocellus placidus* Gyll. 21/3/45 (G).

\* A selection only of the whole of the material appears in the lists for conservation of space.



Fam.—CARABIDAE—continued

- Amara lucida* Dufts. 7/3/45 (G).  
*Feronia cuprea* Linn. 20/4/45 (G).  
*F. vernalis* Panz. 10/4/45 (Ba).  
*Abax parallelopipedus* Pil. & Mit. 22/4/45 (Ba).  
*Calathus melanocephalus* Linn. 21/3/45 (G).

HABITAT GROUP—ARENICOLES

Fam. CARABIDAE

- Calathus erratus* Sahl. 21/3/45 (G).

Fam. STAPHYLINIDAE

- Stenus bimaculatus* Gyll. 20/3/45 (Ba).

Fam. CURCULIONIDAE

- Philopodon plagiatus* Schal. 15/5/45.

HABITAT GROUP—TRUNCICOLES, LIGNICOLES, CORTICICOLES

Fam. CARABIDAE

- Dromius quadrimaculatus* Linn. 28/1/45 (G).  
*D. quadrinotatus* Panz. 28/12/44 (G).

Fam. SILPHIDAE

- Phosphuga atrata* Linn. 28/12/44 (G).

Fam. RHIZOPHAGIDAE

- Rhizophagus dispar* Payk. 28/12/44 (G).  
*R. nitidulus* Fab. 28/1/45 (G).

Fam. COLYDIIDAE

- Cerylon histeroides* Fab. 16/1/45 (G).  
*C. ferrugineus* Steph. 28/1/45 (G).

Fam. ANOBIIDAE

- Xestobium rufovillosum* Deg. 15/5/45 (G).

Fam. LUCANIDAE

- Sinodendron cylindricum* Linn. 29/4/45 (G).

Fam. CERAMBYCIDAE

- Rhagium bifasciatum* Fab. 15/5/45 (G).

Fam. PLATYSTOMIDAE

- Brachytarsus nebulosus* Forst. 17/5/45 (G).

Fam. SCOLYTIDAE

- Scolytus scolytus* Fab. 16/1/45 (G).  
*Hylurgops palliatus* Gyll. 11/3/45 (G).  
*Myelophilus piniperda* Linn. 20/4/45 (G).

HABITAT GROUP—HERBICOLES, PHYLLOCOLES

Fam. CARABIDAE

- Risophilus atricapillus* Linn. 13/3/45 (Br).

Fam. PHALACRIDAE

- Olibrus aeneus* Fab. 4/1/45 (G).

Fam. COCCINELLIDAE

- Adalia bipunctata* Linn. 28/12/44 (G).  
*Psyllobora vigintiduopunctata* Linn. 2/1/45 (G).  
*Aphidecta oblitterata* Linn. 21/3/45 (G).  
*Myrrha octodecimguttata* Linn. 21/3/45 (G).  
*Coccinella septempunctata* Linn. 21/3/45 (G).  
*Anatis ocellata* Linn. 21/3/45 (G).  
*Adonia variegata* Goeze. 21/3/45 (G).

## Fam. NITIDULIDAE

*Epuraea aestiva* Linn. 17/5/45 (G).

## Fam. BYTURIDAE

*Byturus urbanus* Lind. 17/5/45 (G).

## Fam. CERAMBYCIDAE

*Grammoptera ruficornis* Fab. 17/5/45 (G).*G. holomelina* Pool. 17/5/45 (G).

## Fam. CHRYSOMELIDAE

*Phyllotreta nemorum* Linn. 2/1/45 (G).*Phaedon cochlaeriae* Fab. 20/3/45 (Ba).*Lochmaea crataegi* Forst. 23/3/45 (Ba).*L. capreae* Linn. 19/4/45 (G).*Chrysolina staphylaea* Linn. 10/4/45 (Ba).*C. polita* Linn. 10/4/45 (Ba).

## Fam. CURCULIONIDAE

*Apion nigritarse* Kirby. 13/3/45 (Br).*A. subulatum* Kirby. 13/3/45 (Br).*A. miniatum* Germ. 20/3/45, 20/3/45 (Ba).*Caenorhinus pauxillus* Germ. 17/5/45 (G).*Cidnorhinus quadrimaculatus* Linn. 21/3/45 (G).*Ceuthorrhynchus chalybaeus*. 11/3/45 (G).*C. sulcicollis* Gyll. 21/3/45 (G).*Sitona regensteiniensis* Herbst. 21/3/45 (G).*S. hispidulus* Fab. 13/4/45 (G).*S. lineatus* Linn. 13/5/45 (G).*Strophosomus melanogrammus* Forst. 21/3/45 (G).*Phytonomus nigrirostris* Fab. 10/4/45 (G).*P. arator* Linn. 13/4/45 (G).*P. austriacus* Schrank. 16/4/45 (G).*Magdalis armigera* Geoff. 13/5/45 (G).

## HABITAT GROUP—MUSCICOLES

## Fam. STAPHYLINIDAE

*Tachyporus obtusus* Linn. 5/1/45 (G).*T. pusillus* Grav. 4/1/45 (G).*T. hypnorum* Fab. 21/3/45 (G).*Conosomus testaceus* Fab. 13/3/45 (Br).

## Fam. BYRRHIDAE

*Cytilus varius* Fab. 12/3/45 (G).

## HABITAT GROUP—FUNGICOLES

## Fam. EROTYLIDAE

*Biphyllus lunatus* Fab. 7/3/45 (G).*Dacne bipustulata* Thunb. 13/4/45 (G).

## Fam. CIIDAE

*Cis alni* Gyll. 29/4/45 (G).

## Fam. SERROPALPIDAE

*Tetratoma fungorum* Fab. 28/1/45. (G).

## HABITAT GROUP—DETRITICOLES

## Fam. STAPHYLINIDAE

*Tachinus subterraneus* Linn. 20/12/44 (G).*Conosomus pedicularius* Grav. var. *luridus* Erichs. 20/3/45 (Ba).*Lesteva longelytrata* Goeze. 2/5/45 (G).*Philonthus puella* Nord. 20/12/44 (G).

## Fam. CRYPTOPHAGIDAE

*Cryptophagus pilosus* Gyll. 9/4/45 (G).*C. scutellatus* Newm. 20/4/45 (G).

## Fam. CHRYSOMELIDAE

*Phyllotreta nemorum* Linn. 28/1/45 (G).

## HABITAT GROUP—CADAVERICOLES

## Fam. SILPHIDAE

- Aclypea opaca* Linn. 8/4/45 (G).  
*Thanatophilus rugosus* Linn. 16/4/45 (G).  
*Oeceotoma thoracicum* Linn. 13/3/45 (G).  
*Catops coracinus* Kell. 10/4/45 (Ba).  
*Sciodrepa watsoni* Spence. 10/4/45 (Ba).  
*S. fumata* Spence. 10/4/45 (Ba).

## Fam. STAPHYLINIDAE

- Omalium rivulare* Payk. 11/3/45 (G).  
*Tachinus rufipes* Deg. 15/5/45 (G).  
*Philonthus fuscipennis* Mann. 6/4/45 (G).  
*Creophilus maxillosus* Linn. 16/4/45 (G).  
*Ontholestes tessellatus* Geoff. 13/4/45 (G).

## Fam. HISTERIDAE

- Hister cadaverinus* Hoff. 16/4/45 (G).  
*Saprinus virescens* Payk. 15/5/45 (G).

## Fam. DERMESTIDAE

- Dermestes maculatus* Deg. 16/4/45 (G).  
*Attagenus pellio* Linn. 15/5/45 (G).

## Fam. NITIDULIDAE

- Omosita colon* Linn. 19/4/45 (G).

## HABITAT GROUP—STERCORICOLES

## Fam. HYDROPHILIDAE

- Cercyon haermorrhoidalis* Fab. 21/3/45 (G).  
*C. unipunctatus* Linn. 21/3/45 (G).

## Fam. STAPHYLINIDAE

- Oxytelus laqueatus* Marsh. 11/3/45 (G).

## Fam. HISTERIDAE

- Onthophilus striatus* Forst. 23/3/45 (G).

## Fam. SCARABAEIDAE

- Aphodius distinctus* Muel. 23/3/45 (G).  
*A. luridus* Fab. 13/5/45 (G).  
*A. sphacelatus* Panz. 25/3/45 (G).  
*A. prodromus* Brahm. 9/4/45 (G).  
*A. fimetarius* Linn. 13/3/45 (G).

## HABITAT GROUP—STAGNICOLES

## Fam. HALIPLIDAE

- Haliplus lineatocollis* Marsh. 6/3/45 (G).  
*H. wehnckei* Gerh. 6/3/45 (G).  
*H. flavicollis* Sturm. 6/3/45 (G).  
*H. heydeni* Weh. 6/3/45 (G).

## Fam. DYTISCIDAE

- Agabus paludosus* Fab. 6/3/45 (G).  
*A. chalconotus* Panz. 15/3/45 (G).  
*A. uliginosus* Linn. 15/3/45 (G).  
*Rantus grapii* Gyll. 15/3/45 (G).

## Fam. GYRINIDAE

- Gyrinus natator* Linn. var. *substriatus* Steph. 15/3/45 (G).

## Fam. HYDROPHILIDAE

- Hydrobius fuscipes* Linn. 15/3/45 (G).

## THE ROLE OF BIRDS IN CHECKING DEFOLIATING MOTHS

JOHN C. S. ELLIS

THE following notes have been collected during 1944-5-6 in the sessile oakwoods of the Upper Dearne Valley in the West Riding of Yorkshire and refer chiefly to *Tortrix viridana* L. and *Hybernia defoliaria* Clerck., positive evidence being absent for *Cheimotobia brumata* L.

In these woodlands one of the most characteristic features is the presence of a strong growth of bracken (*Pteridium aquilinum*), though this is considerably reduced where there is an admixture of other broad-leaved trees. Another marked character is the paucity of the shrub layer. Both these factors appear to affect the efficiency of the avian check in various ways.

The chief difference between the two larvae concerned lies in the habit of *T. viridana* of pupating in the remains of leaves, while *H. defoliaria* descends to the ground as a full fed larva to pupate, thus gaining a measure of protection in the pupal state in woods where a heavy growth of bracken covers the ground, though the degree of protection afforded is naturally conditioned by the seasonal variation in the vegetation.

### THE EGG.

Actual proof of any species of bird taking the minute eggs of the moths is extremely hard to obtain and is perforce limited to those species which are adapted to feed in those places where the eggs are normally laid.

In this district the most effective check on *T. viridana* is undoubtedly the Blue Tit (*Parus caeruleus obscurus*) feeding as it does very largely from the terminal twigs and bud bases, though at present there is no evidence to show that this habit is more prevalent during an irruption of the moth.

From its structural modifications the Tree Creeper (*Certhia familiaris britannica*) is unable to feed from the slender twigs where *T. viridana* lays its eggs, but feeds from the trunk and stouter branches. It shows a preference for rough as against smooth barked trees in which places it will probably find numbers of the eggs of *H. defoliaria*, as well as crawling females at certain seasons of the year, whereby it operates effectively against the species.

### THE LARVAE.

To appreciate the value of the various factors involved it is better to consider each species of moth separately with its attendant checks.

#### *TORTRIX VIRIDANA.*

Possibly owing to its small size and through its apparent local preference for oakwoods which normally encourage a heavy growth of bracken, Rooks (*Corvus f. frugilegus*) and Jackdaws (*Corvus monedula spermologus*) have not been observed to take this larva freely, though they do so from under infested trees in parkland when they have been dislodged from the foliage. They must thus perform some work of value though there is no information of the numbers likely to be taken by each individual.

In woodland infested by the larvae, the Starling (*Sturnus v. vulgaris*) renders most valuable service by taking the caterpillar while suspended in mid-air as well as from the foliage and, where cover permits, from the ground, while its numbers and habit of hunting in family parties make it additionally effective. Incidentally, it appears to be the only species which has so far adapted itself to circumstances as to take the swinging caterpillar as if hawking for flies, though it does not commonly do this until the young are fledged.

Owing to its method of carrying food to the nest in the beak instead of in a pouch as in the case of the Rook, breeding birds may be seen carrying caterpillars to nests situated well outside the wood. There is no evidence to show if the occurrence of an irruption of either species of moth has any effect on this or other species' subsequent choice of breeding place, but in those species which will use nest boxes, information on this topic should be comparatively simple to obtain.

The Great Tit (*Parus major newtoni*) is the one member of the family which forages freely on the ground in loose litter. For this reason it cannot be reckoned



so consistent a check as the Blue Tit which, when feeding on larvae is often continuously in the infested crowns of the forest trees, particularly oaks, whereas the former tends to feed at lower levels and therefore in thicker cover and does not exhibit the same attachment to a particular feeding area.

Owing to their comparative scarcity in the district and attachment to different habitats the Coal Tit (*Parus ater britannicus*), Marsh Tit (*Parus palustris dresseri*) and Willow Tit (*Parus atricapillus kleinschmidti*) cannot perform the same beneficial work against the pest as do the two previous ones, and it is further not always possible to distinguish between the Marsh and the Willow Tits by sight owing to the amount of industrial soot in the atmosphere dulling their plumage. From notes collected in the winter it would appear that both the black-capped birds tend to feed closer to the trunk and less on the terminal twigs than the other birds.

The method of taking the larvae peculiar to all the Tits is to swing upside down on the infested twigs and pick them from beneath the leaves, but in spite of careful watching in no single instance was any bird seen to attempt to haul a caterpillar up by its life line, though they are notoriously quick to use this method in retrieving swinging baits at the bird table. It is noteworthy that all species which solve this type of problem frequently feed in an inverted position.

Woodpigeon (*Columba p. palumba*) are extremely wary and difficult to watch accurately, but when presumably taking caterpillars they exhibit a preference for oaks growing in open country or parkland where they feed to a great extent beneath the trees on the dislodged larvae, and it is doubtful whether they take many larvae from the actual twigs and branches owing to their being primarily ground feeders not very well adapted to feeding from trees.

#### HYBERNIA DEFOLIARA.

In considering *H. defoliara* the factor of ground vegetation plays a much more important part, preventing some species from attacking the pupating larvae altogether. Attacking as it does a wider range of trees than does *T. viridana*, it has a wider distribution and may thus be expected to meet additional checks, the chief of which is the Rook, which, provided that the bird's breeding season and the vegetation permit, constitutes one of the major checks on the larval state.

These conditions are those in which the young Rook leaves the nest before the bracken expands in the woodland, conditions which were fulfilled in this district in 1945 though the fact that in that year pure oakwoods infested with *T. viridana* were avoided in favour of more mixed woodland infested with *H. defoliara* may be explained in terms of size of the respective caterpillars.

As soon as the young can fly they go to the infested woods in flocks and parties and feed both from the trees and the ground, the method adopted by the tree-feeding birds being to alight on a branch and seize the grubs from the leaves, seldom however, taking swinging caterpillars, and gradually working towards the tip of the branch till forced by its swaying to take wing. During its passage along a branch numbers of larvae are dislodged which are taken by birds feeding on the ground, provided the ground cover has not become sufficiently heavy to impede a bird's "take off."

There has been no observed occurrence of the adults feeding young in the nest on caterpillars, which may be due to a difficulty in retaining caterpillars in the pouch.

Jackdaws apparently feed rather more on the ground than Rooks in woodland, particularly in woods having a high proportion of sycamore, and may therefore be counted as a check on this larva.

The Starling occupies a similar position with regard to *H. defoliara* as it does to *T. viridana*, but it has not been seen to feed upon the larvae on the ground to the extent that might be expected. It is more tolerant of a shrub layer where this exists, than the larger birds. There is little doubt that over the whole larval stage, the Tit family constitutes the most persistent and wide-spread check and from its habit of foraging on the ground the Great Tit probably takes many pupating larvae as well.

The Woodpigeon is probably about as efficacious against *H. defoliara* as against *T. viridana*, but it can hardly be reckoned so effective as the Rook in clearing a given area because of its habit of taking alarm very easily and going clean away. In doing so, however, it probably dislodges a great number of larvae.

## PUPA.

Attacks on the pupa of both species fall very roughly into two categories ; those that feed fairly freely from the tree, when *T. viridana* is the victim, and those which take *H. defoliara* from the ground.

The former class includes the Chaffinch (*Fringilla coelebs gengleri*) which with its young, associates freely with the Tit flocks, exploring the short growths and tufts of leaves along the branches of the oaks but never apparently indulging in acrobatics like its companions. A little later the young Willow Warblers (*Phylloscopus t. trochilus*) take part and though this species is adept at stretching up and hovering beneath the leaf remains it appears very loth to reach forward and downward like a Tit. Owing to variation in time of pupation and emergence it is difficult to decide whether these birds are actually taking the caterpillar, pupa or moth when the latter is in process of hatching..

In the latter class the taking of the pupa of *H. defoliara* is practically limited to that time of the year when woodland cover is reduced to a minimum, usually the late autumn and winter, when the chances of assessing the activities of any species against a given insect are too remote to permit any worthwhile estimate being made. The Great Tit, however, is probably the chief enemy of the insect at this stage.

## THE MOTHS.

Owing to its long and spasmodic period of hatching there is no direct evidence of any species taking the flying male of *H. defoliara*, and probably the Tree Creeper is the most frequent predator on the crawling female though direct evidence has never been obtained of this act. As *T. viridana* hatches about midsummer over a short period and from an elevated position, some direct observations have been possible in 1945 when the hatch coincided with a warm still day.

The attack was made entirely by the smaller species. Their individual methods showed some variation, as did their degree of success. The Chaffinch was one of the most persevering and successful, making a twisting and roughly circular flight from a high perch, falling throughout and contrasting with the Yellow Bunting (*Emberiza c. citrinella*) which made the longest and straightest flight of any species engaged. The latter showed little inclination to twist or circle to its original perch, which lack of adaptation probably made it the least successful species in capturing the moth.

The Tree Pipit (*Anthus t. trivialis*) displayed a unique method in running quickly along horizontal boughs, making little leaps and darts with half-opened wings at passing moths and showing little divergence from normal Pipit behaviour when feeding on low-flying insects from the ground. Although fairly successful, it can hardly be reckoned as anything more than a minor check owing to its comparative scarcity. The main checks are afforded once more by the numerous and persistent Great and Blue Tits, the former pursuing the moth assiduously on the wing on a more vertical line than the latter and keeping closer to the tree. From the number of captures made and picked off, it is probably superior to the latter as a check. The Blue Tit appears to confine its attentions more to what seem to be newly emerged and drying specimens to be found in the remains of the foliage, where it probably takes numbers of pupae as well.

The Willow Warbler, the only warbler observed to take the flying moth regularly and efficiently, uses a technique similar to the Spotted Flycatcher (*Muscicapa s. striata*), having generally rather a flatter line of flight, though it frequently flies upward like that bird. Its sallies, however, lacked the decision and snap of the latter. Exact comparison between the two species was impossible owing to the absence of the Flycatcher from this particular wood. The Flycatcher's degree of success for the comparison with the Warbler's efficiency is therefore based on its behaviour when capturing flies.

Swallows (*Hirundo r. rustica*) and House Martins (*Delichon u. urbica*) although nesting within 300 yards were also not seen in the wood pursuing the moth, though it was of a very open nature. I am informed by A. W. Boyd (*in litt.*) that he has recorded the former feeding young in Cheshire on the moth.

Of all the species observed to take the moth none was seen to make any definite attempt to remove the wings prior to eating it, the occasional falling of a wing being taken to be fortuitous.

## CONCLUSIONS.

The most consistent check on all stages of *Tortrix viridana* is afforded by the Great and Blue Tits.

The most concentrated attack on the larvae of both moths is afforded by the Starling. The presence of a thick bracken layer favours the continuance of an outbreak of *Hybernina defoliaria* by affording protection to its pupating larvae and pupae from ground-feeding birds, though it does not so favour *Tortrix viridana*.

The weather at the onset of the breeding season plays an important part in deciding the efficiency of the checks afforded by the larger birds on the larval stage of *Hybernina defoliaria*.

Attacks on the moths are generally much less concentrated.

## GARDEN PRODUCE (AVIAN) 1946

J. P. UTLEY

My present habitation, occupation of which was taken in October, 1945, comprises nearly three-quarters of an acre of garden, orchard and lawn. The garden may be called 'old world,' but it is perhaps nearer the truth to say that 'once upon a time' it had really been a garden. Years of neglect had left much to be desired from a horticulturalist's standpoint, but from an ornithologist's angle of view it certainly produced items of interest and variety during the past season.

On March 27th the first nest was found which belonged to a pair of Song Thrushes, but a pair of Robins already had a nest as was evident from their behaviour.

During the season thirteen species started nesting operations, eleven laid eggs, hatched them out and successfully reared young. Thirty nests were commenced, 115 eggs were laid, 88 young were hatched out and 76 became fully fledged; 66 per cent. of the eggs produced fledged young. The appended table gives the full results.

Four nests were never occupied; Carrion Crows destroyed the contents of four nests and Magpies of one nest. Children destroyed two nests and a stray dog one.

One pair of Song Thrushes built their nest at a height of 12 feet from the ground in a dense holly bush. This nest was never 'plastered' in the manner usual with the species though mud was used in the general construction, but was most neatly lined with very fine grasses. Two eggs were laid, but unfortunately these were taken by Magpies.

One pair of Blackbirds reared two broods in the same nest, the first egg of the second clutch being laid but a few days after the young of the previous brood had fledged.

The behaviour of a pair of Robins over their second clutch was peculiar. The nest was in a hole in an old apple tree, and after the female had been sitting on six eggs for a week, the nest was deserted. I think a cat had climbed up to the nest but this was not proved. For two days both parent birds spent almost the whole time in repeated visits to the nest. They would alight on the lip of the hole and stand looking at the eggs but would never enter. At the end of the second day I removed the eggs and the next day the pair commenced building their third nest in thick ivy. This also came to grief from the attentions of a prowling dog.

A Cuckoo's egg was discovered just on the threshold of a Willow Warbler's nest in the kitchen garden. That the egg was unsuccessfully placed was due, I am confident, to disturbance, for a Cuckoo was put up from the locality of the nest on the day previous to the finding of the egg.

Both Great Tit pairs built their nests in boxes, and there was considerable difference in their construction. One pair was very fond of bright coloured scraps of wool, cotton, etc., and a very beautiful and substantial 'blanket' was felted. The other was very drab with scarcely any 'blanket' though at this nest five young fledged one morning, but the remaining four did not leave till the afternoon



of the next day. Although the five youngsters 'out in the world' were ready to take all the food their parents could capture, the four left in the nest did not appear to suffer the slightest diminution in feeding time.

Wood Pigeon 'squabs' were the last nestlings to become fledged; they did not leave the nest till September 18th and could not be considered fully fledged till September 21st when they left the nesting tree, and the property.

No account was taken of the nests of House Sparrow (several) or of Starling (one).

In addition to the above a wandering domestic hen made a nest in a clump of nettles and laid seven eggs before she was suspected of misdemeanour by her rightful owner and had her activities curtailed. The eggs were never hatched. It was a pity that she had to be 'controlled,' for I had hoped she would go on laying in the hope of eventually establishing the instinctively accepted clutch.

TABLE OF RESULTS

SPECIES	Nests Per Pair	EGGS		Young Fledged	Percentage Successful	REMARKS
		Laid	Hatched			
Song Thrush ...	1	4	—	—	0%	Deserted.
Song Thrush ...	1	2	—	—	0%	Taken by Magpies.
Hedge Sparrow	4	11	11	11	100%	One nest abandoned before complete.
Blackbird ...	1	2	—	—	0%	Deserted.
Blackbird ...	3	12	9	9	75%	One, three eggs, destroyed by Carrion Crows. Two broods in second nest.
Greenfinch ...	2	5	5	3	60%	One nest destroyed by children. Carrion Crows took two young from second nest.
Greenfinch ...	1	—	—	—	—	Destroyed by children.
Chaffinch ...	2	9	9	4	44%	One nest, five young, destroyed by Carrion Crows.
Wood Pigeon ...	2	3	2	2	66%	One nest, one egg, destroyed by Carrion Crows.
Great Tit ...	1	9	8	8	89%	Abandoned before complete.
Great Tit ...	1	9	9	9	100%	
Magpie ...	1	—	—	—	—	
Robin ...	4	19	12	7	37%	One nest, six eggs, deserted. One nest five young, destroyed by dog.
Blue Tit ...	1	6	6	6	100%	One nest, five eggs, destroyed by Carrion Crows.
Linnet ...	2	9	4	4	44%	
Garden Warbler	1	—	—	—	—	Abandoned.
Willow Warber	1	8	7	7	88%	Unsuccessful attempt by Cuckoo.
Willow Warbler	1	6	6	6	100%	Egg not placed in nest of Willow Warbler.
Cuckoo ...	—	1	—	—	0%	
Total ...	30	115	88	76	66%	



## THE BRIDLINGTON SEASHORE, FEBRUARY, 1947

GEORGE H. AINSWORTH AND JOHN LORD

IN normal winters, Sanderlings and Dunlin are not uncommon birds on the Bridlington sands. On Saturday, February 15th, after three weeks of easterly gales, frost and snow, they were there in hundreds. The Sanderlings ran up and down the water's edge like little clockwork toys, covering twice as much ground as the Dunlins, which flocked with them when disturbed. Purple Sandpipers were feeding, as they have done each winter, under the Spa wall, and in the harbour were five male and five female Scaups, sheltering from the turbulent sea.

The tide was flowing rapidly, aided by a strong north-east wind and the whole face of the sea, far out in the bay, was a white foam of breakers. Sea-spume was being blown off the wave crests and scattered on the sands, yet riding in this broken water were countless Scoters. On whatever part of the bay one focused the glasses small groups of these 'black' ducks could be seen.

Here and there on the last high tide mark, oranges and grapefruit had been left, with broken caks and wreckage of various kinds. From the direction of the wind and the flow of the tide, it was apparent that the general drift was towards Barmston. That was where the Gulls and Waders could be expected to have congregated.

At varying intervals along the sands between Bridlington and Barmston Drain were the remains of Scoters, Scaups, Common Gulls, Black-Headed Gulls and two Gannets. A Puffin, looking very dejected and yet comical was picked up and sheltered under an overcoat, where it appeared to settle down in comfort. However, it died after ten minutes, by which time a Cormorant with insufficient energy to move, and another Puffin had been found.

Arriving near to Barmston one had the impression that the air around the low cliffs was filled with sea-spray. On looking through the binoculars it was seen that this white whirling mass was made up of thousands of Gulls—more gulls even than can be seen when the Kittiwakes are nesting on the Speeton-Bempton cliffs.

On the south side of Water Mill Beck one came upon the first real signs of the tremendous ravages of the sea. One felt that the whole of the sea-bed of the bay had been scoured up. Large planks of wood, parts of aeroplanes and broken cases lay scattered about; one full drum of paint was covered with stalked-barnacles. The stalks were fully four inches in length and indicated that many a storm during the past few years had failed to move it.

The remains of birds were numerous, but not one was complete. Greater Black-Backed Gulls and Herring Gulls had been at work. Grey Plovers with their characteristic listening attitude before taking two or three steps forward, were accompanied by a few Oyster Catchers and were apparently feeding on a species of small, colourless jelly-fish, thousands of which were being brought in by the tide. Shells of Mussels, Whelks and Clams were piled high. War-fish (Solen) had been and were being collected by the sackful and sold as bait. Here and there were dead or dying Conger Eels. Red and Brown Algae were piled up six feet high and this wrack extended for at least a mile.

Here could be seen the terrific destruction of under-water life that had occurred during the past three weeks. Many hundreds of exoskeletons of Lobsters were mixed up with the sea-weeds. Numerous female lobsters had perished and with them their eggs. One live lobster was found. Earlier visitors had found others, one man had a sack filled with lobsters and Conger Eels. A ling six feet in length had been washed ashore and was becoming a meal for Greater Black-Backed Gulls, which had gathered around it. Among the wrack were numbers of small octopi, starfishes, sucker fishes, the remains of edible crabs, dog crabs and jelly fishes.

Feeding on these remains were the thousands of gulls, chiefly Common Gulls, Black-Headed Gulls, Herring Gulls and Greater Black-Backed Gulls. Rather surprisingly, there were two Kittiwakes. On the drier wrack, Redwings and Fieldfares were feeding. Large flocks of Starlings were making a meal of lard, of which there was a good supply. The lard looked quite wholesome, but smelt of diesel oil and had probably been torn out of the hold of some ship, sunk during the war, which was now being broken up by the heavy seas.

This winter has resulted in the loss of much life among animals on the land. Thousands of birds have been destroyed and many insects must have been killed by the long and heavy frosts. But because of the low temperature of the water around our coast and the strong gales which have lashed the seas so furiously, this destruction of life has also taken place in the shallower waters around our East coast.

Certainly there will be fewer lobsters for sale during the coming year.

## FIELD NOTES

*Buxbaumia aphylla* L., in South-West Yorks.—The high rainfall of 1946 has greatly favoured the mossy walls bordering Midgehole Road, the main road to Hardcastle Crag, Hebden Bridge. The Bryophytes on the wall bordering the upper side of the road were included in a 'Botanical Survey of Peckett Wood,' (C. Crossland and F. Needham, *Naturalist*, 1904, 165-175). The wall on the lower side, not included in the survey, is noticeable in this district for quite good clumps of *Racomitrium lanuginosum*, the woolly fringe moss of alpine ecological association. In mid-December I noticed on this wall top a single sporophyte of *Buxbaumia aphylla* growing from a moss cushion bearing immature sporophytes of another kind. The two kinds of moss fruits were very distinctive, the *Buxbaumia* having a very characteristic shape. The gametophyte of this moss is much reduced, there being no visible stem or leaves and the leafy moss cushion consisted entirely of one of our most common mosses *Ceratodon purpureus*. A later visit, searching the length of the wall, proved negative. The only previous Yorkshire record, Sawley Moor, V.C. 65, goes back 100 years to 1845. Mr. F. Crossland of the British Bryological Society kindly confirmed the identity of both mosses.—H. WALSH.

*Riccia sorocarpa* Bisch.—It is an interesting feature in the history of Bryology of the Halifax Parish, which includes part of Todmorden, that although Bolton, in 1775, recorded *Riccia sorocarpa* Bisch as (*R. minima*), there has been no later record. In December, 1946, I met with this hepatic sparingly distributed amongst oat stubble in a field at Midgley, near Halifax. There was also present a *Fossombronia*, probably *F. pusilla*, in more quantity than had come within my experience in the Halifax area. In the absence of spore capsules the species could not be determined. The field has been under pasture and along with other pasture fields in the district, has been ploughed for oats. These two hepatics are stated to be rather common on cultivated land, the spaces between the crop providing surface for colonisation. It is possible that this field receiving more cultivation in the past, enabled *Riccia* and *Fossombronia* to become established and the recent ploughing brought to the surface dormant spores. Two other fields with oat stubble in the same district yielded neither of these hepatics. Dr. W. Watson kindly confirmed the record.—H. WALSH.

*Solorina spongiosa* (Sm.) Carroll.—This lichen is given in A. L. Smith's Monograph as rare in N. England and N.E. Ireland, more plentiful in the Grampians, on ground among rocks and on turf walls in upland districts. In our Yorkshire Floras it is recorded from Ayton and Guisborough Moor, Malham, Keighley, Ingleborough and Whenside.

On January 23rd, I found it near Sulber Nick at the head of Crummackdale, where it was plentiful over two square feet, and small amounts were to be found over five or six square yards, growing on soil always damp from spring water. West's record from the source of Great Blake Ghyll, Whenside, where he found it profusely, is very similar ground. The other species *Solorina saccata* (L.) Ach., is generally to be found all over our limestone area.—CHRIS. A. CHEETHAM.

*Dictyna arundinacea* Linn.—A fine, sunny week following January 16th provided an opportunity to investigate the insect fauna of Thieves Moss, Crummackdale, in winter. The frost, however, had not gone from the shaded sides of the tussocks and winter midges and other insects were not to be found. Sweeping the heather gave a number of specimens of this spider and provided evidence of its activity in January.—CHRIS. A. CHEETHAM.

## MOUGHTON SCAR

CHRIS. A. CHEETHAM

THE name is pronounced as it is spelt in the Enclosure Deed—Mooton. This deed covers the area south of Sulber and east of the Selside-Clapham track. It includes the Thieve's Moss area but the following notes are restricted to the portion south of the Crummack-Horton footpath and defined by the 900 ft. O.D. contour line. It is about 1 mile in width and  $1\frac{1}{2}$  miles in length, being the limestone cap of the hill. The main area lies between 1,250 and 1,300 ft. above sea level, rising to 1,402 ft. O.D. at the summit.

The highest vertical cliffs are at the southern end, these being the 'Long Scar' of the 6 in. map and those on the east side in Crummackdale, southwards from Studrigg Scar. The area lies in the parishes of Austwick and Horton in Ribblesdale, the parish boundaries being marked on the summit by a wall running north and south. The Austwick portion is open stunted pasture, and the Horton portion divided by walls amongst the adjoining farms.

At a first glance the area appears to be purely limestone, but this is not so and botanical students soon find difficulties when Bracken and ericaceous plants are found to be plentiful.

It can be roughly divided into four main areas.

A.—Limestone pavement or clints, about a third of the whole area. This is very deeply fissured and these so-called 'grykes' have a woodland flora left when the woodland was cleared for fuel and for increased pasturage.

B.—A surface of broken limestone in varying degrees of size, about one-sixth of the area, carrying mosses and lichens as the main plants.

C.—The grass-covered portion, about one-third of the whole, mainly covered with Sheep's Fescue, but on some flat areas where more drift has accumulated the useless Mat grass is too plentiful.

D.—The remaining one-sixth is peat covered and carries plants of the heather family.

Before considering the flora of these areas it will be advisable to examine the reason for their variance from typical limestone country. The cause is the Ice Age. One or two things are easily seen. Where rabbits have burrowed into the soil of the grassy portion they have turned out a large proportion of gritty material, most of the small stones being grits. Then all over the hill, rounded grit boulders averaging 12 ins. in diameter are widespread, and these have accumulated in quantity in small ravines.

Another thing that should be seen is the hardened deposit from the glacial water that settled in the smaller crevices of the limestone. In mass it resembles porcelain but it easily breaks down into angular sandy matter.

The track of the glaciers from the high hills of Upper Wensleydale and Swaledale came *via* Ribblesdale and down Ribblesdale; a branch crossed into Crummackdale and gave us the well-known Norber boulders, but the ice-stream does not appear to have travelled over Moughton which had apparently an ice cap protecting the summit. On the opposite side of Crummackdale on the Norber Long Scar it over-ran the summit. There is a line of boulders of Yoredale limestone from the south-west of Alum Pot to the south end of Norber. These evidently came from the Ribblesdale area. This ice flow would be in contact here with the Ingleborough ice, the line of Yoredale boulders marking the junction.

On Moughton there is no evidence of ice-carried boulders but an abundance of water-borne material. Evidently the Moughton ice cap melted away much sooner than the surrounding glaciers, that is the Crummackdale and Ribblesdale masses. A portion of the latter which came across the southern end of Moughton joined the Crummack ice at Wharfe. The result would be an ice-bound lake on Moughton summit. Into this the melting glacial water carried the fine material which concentrated in the interstices of the limestone and made them impervious for a long period. The drift, small stones in the soil and rounded boulders came in this glacial stream and left the large accumulations in the ravine-like hollows on the slopes.

As milder conditions followed, the summit would have a series of lakelets and these were gradually invaded by a growth of rushes, their seeds being easily identified in the soil beneath the peat deposits. Most of this peat was formed from the cover of Cottongrass which next spread over the area. This is also easily identified



in the peat where there is only a very small percentage of Sphagnum and other plants. The peat is about two feet thick in places and as the summit became drier the ericaceous plants found the conditions they required.

In more recent times scrub woodland spread over the area and the grykes in the limestone still shelter many of the woodland plants. There is plenty of Wood Anemone, Dog's Mercury, Wood Sanicle, Primrose and Wood Violets, with Bluebell, Broad-leaved Garlic, Rosebay Willow Herb, Cuckoo Pint, Herb Robert, Wall Lettuce, Wood Sorrel, Great Valerian, and some Lily of the Valley and Solomon's Seal.

During this scrub woodland stage, man found the finest grazing for his animals here. As the area was not fit for ploughing operations we easily find the remains of his homes and enclosures. Some of the earlier more primitive type are small, an enclosure, say 10 to 20 yds. in diameter, with a small hutment in the lee of the rocks. The latest is a house 15 by 6 yds., this width being restricted by the timber available on the spot. This size of house is easily noted and can be seen in many places, near Crummack farm at least a dozen of them can be recognised. With the larger houses the enclosed fields are larger and up to 100 yds. in diameter.

The destruction of the woodlands and the opening up and cultivation of the lower land left the summit much as we find it to-day.

The Juniper has interested our botanists since 1932, when some of the bushes at the west end of Thieve's Moss were dead and others in a dying condition. The rest of the area was thickly covered with healthy Juniper, but to-day practically the whole of it is dead. Similarly, some twenty years before, a large area on Norber Long Scar to the west died off and another area to the east towards Horton had died previously. To-day the finest growth is across Moughton on a line drawn from Crummack farm to Craghill farm.

Under the Juniper the Heart-leaved Tway-blade, a very small orchid, may be found and here rabbits find food and shelter from the foxes that live on the hill. In winter flocks of Fieldfares congregate here, possibly for shelter; I have not seen them eating the Juniper berries. Other birds nesting on the hill are Grouse, Golden Plover, Lapwing, Ring Ousel, Wheatear, Meadow Pipit and Kestrel, whilst Raven, Buzzard and Peregrine are occasional visitors.

The ferns have long been an attractive feature of the hill and were a means of profit to gatherers in the 'eighties. The older gardens in Austwick usually have Holly ferns and so-called 'crested varieties' of Hart's Tongue and other species. Amongst the Bracken the Northern Hard Fern is found. Usually common species like the Male, Lady Fern and Common Polypody are not plentiful, but the Spleen-worts, the Green, Common and Wall Rue are abundant, so is the Hart's Tongue and the Brittle Bladder. In the grykes and amongst screes there is plenty of the Limestone Polypody and Rigid Buckler. The Prickly Shield is plentiful in odd places and the rare Holly Fern is still to be found.

The most interesting plants are found on the cliffs and screes, possibly because they are out of the grazing range of the rabbits and sheep which control the growth on the grass areas.

The Sea Bladder Campion makes a fine display on the Moughton Long Scar and it also occurs above the Wetstone Hole at the north-west and midway along the east side. The Spiked Speedwell (*Veronica hybrida*) grows on this Long Scar and this is its only station in Yorkshire. The Twisted-podded Whitlow grass, Small Scabious, Gibson's Hawkweed with blotched leaves, so often mistaken for the Spotted Catsear, Salad Burnet and the Burnet-leaved Rose, are here, but it is only on the screes that we find the Purple Saxifrage and the more uncommon species of mosses like *Hylocomium rugosum*, *Cylindrothecium concinnum* and *Thuidium Philiberti*. The cliff at the south-west corner overlooking Crummackdale is covered with a lichen *Placynthium nigrum* which blackens a large portion of the surface and gives a very different appearance to this cliff of white limestone.

The main Bracken areas are at the Wetstone hole and just south of Studrigg Scar. Both face west and are deep hollows where the gritty drift has accumulated to a depth up to two feet. The Bracken has displaced Mat grass from these places.

On the clints or limestone pavement there is a rich flora of lichens for the specialists. The bright green of *Solorina saccata* is found in sheltered corners, fairly large patches of *Squamaria cartilaginea* looking like splashes of mortar are frequent, so is the black lichen of the cliffs and yellow species of *Xanthoria parietina* and *Placodium flavescens* and small grey plants of *Physcia hispida*. Mosses are



plentiful, but with the exception of *Fissidens decipiens* and *Hypnum chrysophyllum* they are species normally seen on limestone walls and hedgerows. The woodland relic flora and the ferns of the grykes have been mentioned previously.

The second area is free from drift and the main plant is the woolly fringe moss, *Racomitrium lanuginosum* with the curly-leaved *Trichostomum tortuosum* coming second. With them are the Reindeer lichens, *Cladonia rangiferina*, *sylvatica* and *uncinalis* and the brown prickly *Cetraria aculeata*. Odd tufts of grass occur, principally the Blue Sesleria where the limestone is more open and there is practically no soil, and the Sheep's Fescue where a little soil is present and the limestone more finely divided.

The third area is grassland developed on thin drift and an intermediate between these two introduces many limestone species. More mosses are present, a swollen variety of *Hypnum cupressiforme*, a short form of *Ditrichum flexicaule*, a little *Hypnum molluscum* and *Camptothecium sericeum* and the deep-brown liverwort *Frullania dilatata*. In one place there is a fairly large area of Nowell's moss *Zygodon gracilis*. It is only known on old walls elsewhere in the country.

Amongst flowering plants the Three-fingered Saxifrage, Spring Whitlow grass, Wild Thyme, Vernal and Thyme-leaved Sandworts, Biting Stonecrop, Purging Flax, Eyebright, with two small sedges, the Spring and the Flea, are first to appear, and as the area gets more grassy the Carline Thistle, Hoary Plantain, Salad Burnet and Rockrose are mingled with the Sheep's Fescue and other grasses.

The Mat grass areas are most noticeable in winter, the foliage, not liked by animals, turns a light straw shade and stands out boldly. It is generally a pure growth and requires the greater depth of soil that has been washed down from the slopes on to the level areas.

The plants on the peat are also controlled by grazing, Cowberry does not appear to be cropped and is increasing, so is the Crossleaved Heath in the damper places. Ling and Bilberry are eaten and stunted, Cowberry is only in limited quantity. On these plants, lichens, termed Heather rags, *Hypogymna physodes* and *Cetraria glauca* are found and on the peat the fairy-cup lichen and the scarlet-fruited *Cladonia* occur. The chief moss is *Campylopus pyriformis* with some *Ceratodon purpureus*, *Webera nutans* and the flat variety of *Hypnum cupressiforme*.

In the wetter parts the Single-headed Cottongrass and occasionally the Deer's-hair Scirpus are found with several species and varieties of Sphagnum. There is one place where springs occur on a flat limestone surface and we find the Gothland Sandwort, Mealy Primrose and Butterwort.

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### AN INTERESTING HYBRID POPPY.

CATHERINE M. ROB., F.L.S.

THE spontaneous occurrence in a Yorkshire garden of a hybrid Poppy (*Papaver dubium* x *P. somniferum*), of which I have been unable to find any record, seems worthy of note.

Both parents are now generally admitted as members of the British flora and therefore the occurrence of the hybrid is of more than local significance. For some years *Papaver somniferum* L. has grown at Catton Hall and has been allowed to seed itself freely each season. *P. dubium* L., which is very common in the neighbouring arable fields has established itself in the garden as an annual weed and rather than eradicate it, I have preferred to leave it almost undisturbed. Last year (1945) the two species grew in close association where the hybrid appeared in 1946.

It should be mentioned that both *Papaver Rhoeas* L., a very troublesome weed, and *P. pinnatifidum* Moris also occur in the garden, but the characters displayed by the hybrid exclude these plants from consideration as possible parents.

Only one plant of the hybrid has been seen and this arose in the midst of a batch of normal *P. somniferum*. It was only when the plants were in flower that I became interested in one with scarlet petals. Close examination disclosed that this plant was not *P. somniferum* and an assessment of its characters led me to the

conclusion that it must be a hybrid of *P. somniferum* (clearly the dominant parent), with one of the red-flowered species which were growing near at hand.

The facies of the hybrid suggested *P. dubium* as the second parent and the pubescence characters confirm this view. The hybrid, indeed, combines the characters of the suggested parents, as is shown in convenient form in the table below. These tabulated characters are derived solely from observations made on plants growing at Catton near Thirsk, V.C. 62.

	<i>P. dubium.</i>	<i>P. somniferum.</i>	<i>Hybrid.</i>
Habit	Branches spreading, slender from ground level.	Branches stout and almost vertical.	Intermediate but approaching <i>P. somniferum</i> .
Leaves	Lamina deeply pinnatifid or bipinnatifid; the lobes bristle tipped; cuneate at the base; very sparsely pubescent on both surfaces.	Lamina broadly ovate or ovate-lanceolate; prominently auriculate at the base; broadly crenate at the margin; glabrous on both surfaces.	Lamina deeply lobed, the lobes crenate and bristle tipped; cuneate to slightly auriculate at the base, almost glabrous on the upper surface; slightly pubescent on midrib and nerves beneath.
Stem pubescence	Hairs sparse, and spreading towards the base of the stem; dense and adpressed towards the apex.	Glabrous or with very sparse hairs towards the top of the pedicel.	Sparsely hairy, hairs adpressed in the upper part of the stem, especially when young, more spreading later.
Buds	Ovoid, tapering to a rounded apex.	Ellipsoid, grooved at the apex.	Ellipsoid grooved at the apex.
Sepals	Shaggy, with obliquely spreading hairs.	Glabrous	Glabrous.
Petals	Pale scarlet with a small maroon blotch at the base.	Dark scarlet with a big maroon blotch at the base.	Bright scarlet, first flowers with a dark blotch at the base, becoming less marked in the later ones.
Filaments	Maroon, darker in the middle.	Lilac, expanded at the top.	Intermediate in colour, between <i>P. dubium</i> and <i>P. somniferum</i> , very slightly expanded at top.
Anthers at dehiscence	Light grey edges, pale yellow centres.	Pale grey edges, very pale yellow centres.	Pale grey edges, creamy yellow centres.
Stigmatic Rays	6-7 yellow or mauve when in flower, brown later.	9-12 creamy green in flower, purple-black later.	8-9 cream in flower, brown later.
Capsule	Narrowly obconic.	Subsphaeroid.	Broadly turbinate.

An examination has been made of the pollen of the hybrid and the grains under the microscope are irregular in size, misshapen, and have the appearance of being abortive. The sterility extends to the ovaries, as no fully developed seeds have been found in any capsules examined.

I am indebted to Dr. G. Taylor of the British Museum for his kindness in assisting in the compilation of these notes and for examining specimens of the hybrid and the other species of *Papaver* from Catton. He also saw the hybrid *in situ* and agrees with the parentage suggested.

# THE YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) COMMITTEE FOR ORNITHOLOGY

Chairman : R. M. Garnett.

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East Riding : G. H. Ainsworth and J. Lord, M.Sc., 144 Gillshill Road, Hull.

West Riding : R. Chislett, M.B.O.U., Brookside, Masham, Nr. Ripon.

York District : E. W. Taylor, M.B.O.U., 11 The Avenue, York.

Hon. Secretary and Editor of Records :

Ralph Chislett.

## Report for 1946.

A STATEMENT of the principal activities of the Committee in 1946 was included in the General Report of the Union published in *The Naturalist* for January to March, 1947.

My next task was to assemble specifically the notes sent by members and others to the West Riding Recorder, and to consider them critically and comparatively alongside those already assembled by the Recorders for the North and East Ridings and the York District, with a view to publication of whatever seemed to be of enough present or future interest or value and for which space was available.

A considerable number of people have contributed to this report. We are grateful to all of these whether contributors of occasional notes or the more extensive records and observations which form the backbone of the report. Especially do we welcome the contributions that have come from ornithological visitors to Yorkshire, attracted either by business, military, or other commitments, by Yorkshire scenery and the birds it holds, or by our Bird Observatory. The list below of names of contributors includes several such visitors, among them the names of leaders in the national ornithological field.

An increased number of observers continue to find evidence of passage inland of species that formerly were thought to be merely coastal passage migrants and coastal winter residents, which never breed in Yorkshire and rarely occur after early or late autumn. All that occur in spring are seen much more frequently in autumn, a remark made with special reference to Swillington Ing by A. G. Parsons, who adds that he finds the smaller, outlying pools at Swillington to be often more profitable for observation of waders on autumn evenings than the margins of the big flash, especially in a year of much rain. Other West Riding assistance for which I am especially grateful includes the sequential survey of species visiting the Gorpse Reservoirs tabulated again by E. W. Watson and the tabulated observations of ducks that have visited Farnley Lake and Lindley Reservoirs, by J. E. Beckerlegge. These provided much information in convenient form, as also did the report of the Bradford Naturalists' Society prepared by E. Holmes, and the records of the Wharfedale Naturalists' Society, to which W. E. Fearnley gave me access and supplied additional information, and those of the Wakefield Society, prepared by J. H. Howes.

The year began with frost and a few inches of snow, lasting about Masham until January 25th, when the snow disappeared in the night and aconites opened in the morning. Thence until December, weather was mostly mild, never hot, with no long periods of fine weather after April and with a rainfall described as the heaviest in the county for 43 years. The frequent rains kept the reservoirs full and mud margins generally covered thus affecting distributions of migrant waders, but they seemed to have little effect on successful breeding by passerine birds. In the Vale of Pickering, R. M. Garnett found the heavy rains, in combination with the extensive drainage that has taken place, resulted in a swifter flow from the tributary streams into the Derwent, with consequent more extensive flooding in the Vale than usual, which provided attractions to passage waders and led to some interesting records.

Much time was given by the Chairman to the Forestry Commission's nest-boxes which were inspected on May 29th by Mr. J. M. W. Mackenzie of Balbeggie, who has had much experience of this work abroad and in the Forest of Dean. In this second season in North Yorkshire, shortage of labour delayed the erection of 20 further boxes until the end of April, with a consequent drop in the percentage of



boxes occupied. Altogether 56 boxes are now in position, of which 46.5 per cent. were occupied, 25 per cent. by Tits of three species and 18 per cent. by Pied Flycatchers which used two boxes in a forest where the species had not previously been known to breed. For the first time, Redstarts occupied two boxes.

In the East Riding, so much time had to be given to the ringing-trap and to the furnishing of Warren Cottage that G. H. Ainsworth and J. Lord found it impossible properly to get the Humber foreshore, the River Hull, the mouth of the Trent and other centres of interest covered during the migration season. As a consequence, less progress than had been hoped for was made with problems of routes to the west by the Aire Gap and the Don and Trent Valleys. Grateful acknowledgements are due to G. H. Ainsworth and his helpers for their labours and self-sacrifice.

As much in the hope that light may eventually be cast on the places of origin, routes of travel and destinations of the passage migrants that yearly occur in the Calder valley, as on the same questions regarding the local breeders, the Halifax Zoological Group have established a new ringing-trap at the High Royd Sewage Works by the side of the Calder. They have been able to draw on their many years experience and knowledge of the area and on experience gained at Spurn and elsewhere by their recorder G. R. Edwards. A report of the first year's working will be awaited with great interest.

#### SPURN BIRD OBSERVATORY AND RINGING-TRAP (G. H. A., J. L., and R. C.).

Since its opening at Whitsuntide, the cottage has been occupied for varying periods by 35 people, including all the members of the sub-committee, Miss E. P. Leach (B.T.O. Ringing Scheme Hon. Sec.) and Mr. W. B. Alexander, under whose chairmanship on October 5th, was held a meeting of the Bird Observatories sub-committee of the B.T.O., with Skokholm and Skomer, Fair Isle, the Isle of May and Spurn all represented. 299 birds at Spurn have been trapped and ringed to Dec. 31st, 1946 and 14 were captured a second time, covering 34 species. Twenty-seven on October 24th was the largest number trapped in one day and the trapper on that day hopes to be in charge for periods during the spring and autumn migration seasons of 1947. Improvements to the trap are being effected that it is hoped will considerably increase the number of birds ringed in 1947, and thereby the possible chances of recoveries of interest. The roll-call of species identified and the log-book of observations kept in the cottage have been completed on 65 days since Whitsuntide, during which period 130 species have been noted, with 55 on September 16th as the greatest number recorded on one day.

Species caught and ringed were: Blackbird, 65; Greenfinch, 59; Song-Thrush, 23; Willow Warbler, 20; Robin, 20; Whitethroat, 18; Goldcrest, 11; Wren, 11; Mealy Redpoll, 9; House-Sparrow, 8; Hedge-Sparrow, 8; Pied Flycatcher, 6; Redstart, 5; Chiffchaff, 4; Lesser Whitethroat, 4; Chaffinch, 3; Brambling, 3; Swallow, 3; Meadow-Pipit, 2; Linnet, 2; and one each of Wood-Warbler, Blackcap, Spotted Flycatcher, Ring-Ousel, Redwing, Cuckoo, Short-eared Owl, Red-breasted Flycatcher, Great-Tit, Blue-Tit, Reed-Bunting, Sand-Martin, Sparrowhawk. The classified notes contain many references to the work at Spurn.

Mention should be made of the scheme for examination of birds found dead, with special view to the determination of sub-specific races which Alfred Hazlewood (54 Somerset Road, Bolton) had begun in 1940 and which he has now resumed. Skins will eventually be sent to the Yorkshire Museum, York. In 1946, Continental Goldcrest (see Classified List) was the only sub-specific race represented in his report.

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The numbers preceding the names of species in the following list are those employed in Witherby's *Handbook of British Birds*. 195 species have been seen during the year; notes concerning 176 are included.

### CLASSIFIED NOTES.

1. RAVEN.—A pair called and demonstrated above Great Whernside on March 31st (R.H.). On moors adjacent an odd bird was seen on March 24th, and three young on June 13th (J.P.U.). In the north-west a nest held three eggs on March 2nd and was robbed later. Another nest had four young on April 19th (A.W.). A Raven was trapped at sheep's carcass on Grassington Moor on October 8th, it was one of seven (W.F.F.); and two were seen near Austwick on November 6th and 7th (G. A. Shaw). In early October, 1945, a fox-shooting party found a Raven's nest with 5 eggs—a gallant late effort, but they were taken (A.W.).

2. HOODED CROW.—An odd bird at Riffa in Wharfedale was taking the food of domestic hens on January 24th (W.F.F.). Numerous about Goathland in February and March (W.S.M.), and at Spurn up to early April (G.H.A.); one seen May 19th and 20th (H.O.B.). In autumn, first seen at Spurn on October 7th (W.B.A.), after which arrivals were normal.

3. CARRION CROW.—Returned gamekeepers are already reducing numbers again in some districts, but flocks of 20-30 birds were often seen about Clifton Ings (E.M.R., E.W.T.). During April small parties moved south along the Spurn Peninsula (G.H.A., J.L.). A bird in Thornton Dale on November 27th, carried what looked like a dead mole in its foot, transferring it to its beak high in the air before dropping it (R.M.G.). A pure white bird frequented Coniston Cold from July 29th (R.T.).

4. ROOK.—The species was noted at Spurn in April and on various dates in the autumn. The first noted immigrant flock occurred near Bridlington on August 10th, heading south-west (J.H.B.).

5. JACKDAW.—Flocks came in from sea over the Wolds near Bridlington from August 10th, mingled with Rooks (J.H.B.). In the autumn and winter large numbers of winter sojourners were seen in many places from the coast far westward. In Leeds a nest held fully-fledged young on October 5th (H. Walker).

7. MAGPIE.—Nested at Spurn in a pile of barbed wire (J.L., G.H.A.). At Sheffield a W.E.A. class in ornithology under L. Carr, surveyed for Magpies an area roughly covering a five-mile radius from the city centre, totalling about 75 square miles, of which half is 'built-up.' 619 Magpies were observed and 258 nests were in use this year, mostly in hawthorn, but ash, beech, elm, holly and oak were also used. The suburbs of large towns have been a main reservoir for this species for many years.

11. BRITISH JAY.—Among towns where Jays are numerous in gardens of residential areas are Harrogate (K.I.) and Sheffield (R.C.). At Wassand on April 24th a gamekeeper saw his first there for many years (G.H.A.).

14. STARLING.—An adult bird ringed by R. M. G. at Thornton Dale on January 3rd, 1946, was recovered at Winterton, Lincs., on February 3rd, 1946.

Adult birds were ringed at York by Bootham School on 30/9/38 and recovered where ringed —/10/45; on 14/12/44 and recovered at Barnsley, 13/2/46; on 5/2/46 and recovered at Grantham, Lincs, 23/2/46; on 23/2/42 and recovered at Jylland, Denmark, 1942; on 26/1/42 and recovered at Aaby (Fyn), Denmark, 24/9/45. (All from the report of Miss E. P. Leach in *British Birds*.)

A daybreak visit to the roost described in last year's report on February 15th (with sunrise at 7-15) saw 95 per cent. of the birds leave in a two-minute eruption at 7-25, flying in all directions. At 7-33, a second final eruption was very much smaller—departure seemed to be more leisurely (R.C.). This roost appeared to be abandoned in the late autumn. Near Bedale, another roost was estimated at over half-a-million birds by J. P. Uteley in December, which he considered to be a conservative estimate; one dense flock that came in at 4 p.m. was about a quarter of a mile in length and half as much wide. The site was composed almost entirely of dense elder. Records of several smaller roosts have been made; and of one in Ryedale, estimated on November 14th at not less than half-a-million birds (R.M.G.). I saw a cream-coloured bird on May 7th near Masham—a very striking bird (R.C.); a flock near Wombledon contained a buff-coloured bird (A.G.). The great majority of the birds that struck and flew round the Spurn light on the night of October 19th during a rush of migrants and with an E.S.E. wind and a ground haze, when more birds were affected than on any night for some years past, were Starlings, but a juvenile Blackbird, two Chaffinches and a hen Brambling were caught among the packed Starlings. At 3-0 a.m., fog reduced the visibility and the birds disappeared but for odd ones (H.O.B.).

18. HAWFINCH.—On February 1st, a party of six flew over Knaresborough north until out of sight. On February 10th a noisy party of seven were also seen flying north (R.H.). A few pairs breed annually in the Bretton district (J.C.S.E.) and in the Barnsley area (W.E.H.). A nest held 4 eggs near Horbury on June 11th; a further nest, in which young had been reared when located on October 23rd, was possibly the home of a second brood of the same pair (J.K.W.). Birds have been seen at Menston, Otley, Ilkley, and a pair bred near Bolton Abbey (W.F.F.), and a family party sampled Lord Bolton's peas near Wensley in the summer. A bird was picked up injured in January at Bedale (R.C.); and odd birds have been seen at the Scarborough Mere (A.J.W.), in Kirkdale on April 24th (C.E.A.B.), at Risby on May 15th (G.H.A.). Immature birds at Swanland on September 15th were extracting seed from broomtops and busy with damson kernels (F.C.N.). At Bolton Abbey, yew berries fell over the threshold of the open door of the parish room and sometimes Hawfinches were found in the room, out of which they could not find their way, through either door or windows. One bird was there for two or three days until captured with the aid of a pole and released (C.F.T.).

19. GREENFINCH.—Numerous at Spurn on October 24th and 25th. Of 59 Greenfinches caught in the trap, many had been disturbed when feeding on seeding burdock (G.H.A., R.C.), on which plant three birds fed near Bretton Park on October 28th (J.K.W.). The berries of *Daphne Mezereum* are eaten when green (F.C.N.). In July damage by a family party ensued to my strawberries (W.S.M.).

20. GOLDFINCH.—Too well re-established in most parts of the country to need comment this year.

21. SISKIN.—Wharfedale Naturalists record parties in February and March near Ilkley and Menston. Alders by Hornsea Mere held 25-30 birds on March 16th (J.L., G.H.A.). In the autumn Siskins occurred at Kelleythorpe, seven on September 27th (J.H.B.), at Spurn, one on October 12th (H.O.B.) and several on various later dates (G.H.A., R.C., etc.). In mixed parties of Siskins and Redpolls near Helmsley in autumn the latter predominated (A. Gordon). A party of 10-20 occurred near Ripon on November 21st (H. G. Brownlow). A small party in Thornton Dale on December 28th and 30th was R.M.G.'s. first record there in mid-winter.

23. MEALY REDPOLL.—A bird was seen with Siskins at Hornsea Mere on March 16th (J.L., G.H.A.). Several small flocks were about the Kilnsea Warren from October 20th until November 3rd, eight of which were examined in the hand before being ringed and released (R.C., G.H.A., J.L., E.C.). Present in the Haxby (York) district from October 24th to mid-December (F.J.).

25. LESSER REDPOLL.—Twenty were resident in riverside alders at Knaresborough from December 25th (R.H.). A party of five occurred at Spurn on October 24th (G.H.A., R.C.). In the breeding season this species appeared to be fewer than normal, but the decrease was probably local (R.C.).

26-27. HORNE-MANN'S REDPOLL, OR COUE'S REDPOLL.—Two birds in a flock of 12 Mealy Redpolls on November 2nd near Kilnsea Beacon showed pronounced white wing-patches and the rump of one was seen to be white (J.L., G.H.A.).

29. BRITISH TWITE.—Breeding occurred as usual close to the western county

boundary and a nest with five eggs was found and three pairs located near Todmorden (A. Welch).

33. **BRITISH BULLFINCH.**—Whilst A. J. Wallis reports an increase in Bullfinches about Scarborough; from the Bretton Park side of the Huddersfield area, J. C. S. Ellis finds the species almost disappeared. In general the bird continues to be well distributed in suitable habitats.

36. **COMMON CROSSBILL.**—Reports are few this year. A male was seen and a female heard near Ampleforth College on May 8th (O.J.L., J.B.C.). A small party in a plantation in lower Wensleydale on September 8th was composed mainly of juveniles, with only a few birds showing the red of maturer masculinity (J.P.U.).

40-41. **CHAFFINCH.**—Early October, and again in early November, were the periods of greatest numbers at Spurn. Two were caught at the lantern in the night of October 19th (H.O.B.).

42. **BRAMBLING.**—First seen at Spurn on September 30th (W.B.A., G.R.E.), where about 100 were counted on October 25th in a dump of wire (G.H.A., R.C.). About 100 birds fed in beeches in the garden at Ferriby in November and December (B.B.). Records from other districts were of smaller parties and odd birds, but a flock in Thornton Dale from November 6th increased in December (R.M.G.); and some 40 birds occurred along the Pickering to Malton road on December 15th; and 20-30 at Follifoot on the same day (R.H.). During December about 20 were present near Cowling in the valley between Hildwick and Colne (T.S.) and 50-60 roosted in a garden at Threshfield in November (K.C.C.).

43. **CORN BUNTING.**—Absent from Clifton Ings on April 28th (E.W.T.), but on June 11th eight or nine breeding pairs were present (E.M.R.). Still colonised about Snaith (P.A.H.); and no evidence of any decrease about Swanland or Melton Bottoms, where it is numerous as ever (B.B.). A bird sang in lower Teesdale on October 30th (J.P.U.).

44. **YELLOW BUNTING.**—Late nests were found by F. Newton with three eggs near Rotherham on August 18th and by D. Utley with three young in the Vale of Mowbray on September 15th. In lower Teesdale a bird sang on November 6th (J.P.U.). A nest at Wawne on June 22nd, with 4 eggs, had no hair in the lining (G.H.A., J.L.).

50. **ORTOLAN BUNTING.**—A bird seen at Spurn on September 2nd by J. Lord and C. M. Swaine had a pink bill with yellow ring round the eye and gave a shrill note rather like one of the Tree-Pipit's.

59. **SNOW BUNTING.**—Two were on the shore at Spurn on February 23rd (G.H.A., J.L.). A bird on Read's Island (Lincs) on October 12th fed on seeds of sea-aster (R. F. Wormald). On November 16th, about 30 birds occurred at Skipsea (F.J.). A small party frequented Redcar sands in January and again in November (O.C.H.). Two birds were seen near Goathland on February 3rd (R.M.G.), and a party of 15 at Horcum on December 4th (W.S.M.).

62. **TREE SPARROW.**—Birds occurred as migrants at Spurn—five on September 2nd (J.L., C.M.S.) and ten on October 25th (G.H.A., R.C.). Occurrences inland in the county were normal and fairly numerous.

70. **SKYLARK.**—The species is a common breeder around Kilnsea and is almost always present. A large movement took place at Spurn in the period September 28th—October 2nd. A partial albino which had been noticed during April and early May was seen in the same locality on December 1st (G.H.A., J.L., J.R.W.), and December 28th (G.H.A., J.H.B.).

[74. **TAWNY-PIBIT.**—Seen at Spurn on September 23rd in company with Meadow-Pipits, a Pipit with long yellow legs, long tail, grey sides to head, lightly streaked breast, dull brown back with darker striations. It had an undulating flight (G.H.A., J.L.).]

75. **TREE-PIBIT.**—Earliest record April 3rd, in lower Teesdale (J.P.U.), with April 12th near Ilkley Tarn (D. Hinchliffe) as the second.

76. **MEADOW-PIBIT.**—Large numbers were about Swillington Ing slag-heaps in September and early October, at least 400 on one occasion (J.K.W.).

81. **ROCK-PIBIT.**—Birds possibly on autumn passage were numerous at Scalby Mill, Scarborough on October 11th (R.M.G.). The species was noted at Spurn on October 1st and 2nd (W.B.A., G.R.E.), and on several other days.

88. **YELLOW WAGTAIL.**—The earliest spring records were, April 10th at Horbury (J.K.W.) and at Wawne (G.H.A.), and April 13th on Malham Moor (S. Moorhouse), and on the 18th at several places. 30-40 birds arrived on Clifton



ings on April 16th and became paired soon afterwards (E.W.T.). Appeared occasionally at Spurn from August 11th until September 28th, five being the largest number seen on one day on September 8th (R.C.), on which date a flock of 20 appeared at Dewsbury Sewage Farm (J.K.W.).

89. GREY WAGTAIL.—Seen by Hornsea Mere on March 21st (J.R.W.). A cock bird appeared near Masham on March 23rd and was joined by a hen on the 26th, but I did not find the nest of this pair until April 26th, when it held 3 eggs and was built in a tin-can wedged into a stream-bank. The eggs in another nest hatched on May 2nd and a third pair had young outside the nest on May 8th (R.C.).

90. PIED WAGTAIL.—At Swillington Ing about 50 appeared on April 3rd. In the autumn about 100 birds were there on October 5th, after smaller numbers had been noted during September (K.D.). On October 20th, just before dusk, a large number, moving S.S.E. (approximately 1,000 birds) may have been on their way to a roost. Similar, but smaller movements were noted on October 16th and 22nd (J.K.W.). Noted on the foreshore at Ferriby, 15 birds on September 8th and 10 at Hessle on the 9th (E.C.). Small parties appeared at Spurn in last week of September (F.M.G., C.W.G.P.).

91. WHITE WAGTAIL.—Occurred in spring at Bingley Sewage Beds, one on March 25th (S.L.), at Woodlesford on April 21st (P.B.), two at Elland Sewage Farm on May 2nd (G.R.E., E.W.W.), at Ossett Spa Sewage Farm, one each on May 26th and 31st (J.K.W.), and at Spurn, one bird on April 23rd and May 5th (J.R.W., R.M.G., C.E.A.B.).

96. NUTHATCH.—For extension of breeding to Thornton Dale and detailed observations of behaviour and habits during which the cock bird took cheese from fingers and perched on R.M.G.'s knee, see *The Naturalist*, January-March 1947, pp. 11-12. A pair were nest-building in Egton Woods on April 7th (C.E.A.B.). Plentiful near Wensley and a frequent visitor to the bird table (Lord Bolton).

97-100. GREAT TIT AND BLUE TIT.—Single birds of each species were caught and ringed at Spurn on September 28th and October 6th, respectively. P. Baldwin reports seeing over 100 Great Tits together in woods near Horsforth on July 7th.

108. WILLOW TIT.—A nest at Wawne in elder held 9 eggs on May 6th (G.H.A., J.L.). At Skipwith at least 5 pairs had young on June 30th (H.O.B.). Odd birds have again been noted in the Swillington Woods in August and at Hook Moor on April 25th (J.E.B.), and the Coxley Valley on June 23rd (J.K.W.). A pair was seen in Thornton Dale in April (R.M.G.).

107. MARSH TIT.—One bird at Skipwith Common on June 3rd was of this species (T.R.T., J.E.B.).

111. LONG-TAILED TIT.—Plentiful near Masham. I saw the first paired birds on January 28th, four days after the snow melted. A pair were building on March 16th in the 30-foot-high fork of an ash. Another pair were building in gorse on March 26th (R.C.).

114. GREAT GREY SHRIKE.—Three were noted near Kilnsea on October 12th and gave excellent views, and one on October 27th (J.R.W., G.H.A., E.C., H.O.B.). Two were seen on Dalby Warren on November 5th by J. T. Green; and one in November and early December by a forester. One occurred on Pexton Moor on December 8th and near Lockton on December 18th (R.M.G.).

119. RED-BACKED SHRIKE.—A male at Spurn on May 25th was in splendid plumage (E.B.B.).

120. WAXWINGS.—Immigrants of autumn, 1945 were still to be seen near Scarborough on January 6th, 1946—50-60 birds (A.J.W.), and about 20 at Eston in lower Teesdale on January 30th (J.P.U.). In the late autumn of 1946 reports of Waxwing began to accrue from various parts of the English and Scottish coastal areas. By November 9th, 12 immigrants of 1946 were at Castle Hill, Scarborough, and at least 30 in Middlesborough on November 13th, where numbers increased during November to about 100 and dwindled in December to single birds (O.C.H.). About 50 roosted in apple trees at Marton-in-Cleveland on November 16th (O.C.H.), and eight were in Thornton Dale (J.T. Green), and a bird at Ellerburn on November 22nd was feeding on guelder berries (R.M.G.). In Castle Howard Park, six were noted on November 27th (Ampleforth Notes). Small flocks occurred near Ampleforth in November (F.J.). A bird at Kelleythorpe on November 19th was the earliest recorded south of the Vale of Pickering (J.H.B.). In December birds were seen at many places. About 16 were at Uppang, Whitby on December 1st (A.B.W.). Ten were in gardens at Tweendykes, Hull on December 2nd and the party had in-



creased to 30 birds by December 9th and were still there on the 14th (J.L., G.H.A.), on which date 30 were seen in Holderness Road, Hull, by Miss G. Ramsdale and Mr. Pentith, which had increased to about 100 birds by December 15th (G.H.A.) (J.L.); and 56 birds were in the same hedge on December 22nd and 31st, and seven were in James Reckitt Avenue, Hull on the 31st (G.H.A.). Elsewhere in the East Riding birds occurred at Driffield, two on December 15th (J.H.B.); at Wassand, two on December 25th (E.C.); at Aldborough, four on December 28th (H.G.F.); and four at Spurn on the same date (J.H.B., G.H.A.), and 60 at Pickering Park Hall on December 24th.

In the York district two birds were noted on many occasions from November 16th, and had become five by December 26th (E.M.R., E.W.T.). After a bird had been noted at High Royd Sewage Works (far into V.C. 63) on November 29th (G.R.E.), records west of the central plain were all in December. Six birds fed on berries near Swillington Ing on December 5th (J.K.W.). On December 15th at Bolton Hall, Wensleydale, Lord Bolton saw two flocks of which the largest numbered some 60 birds, and which remained thereabouts until after the year end and included yew berries in their diet. On the same day about 20 were seen along the Skipton-Grassington road (C. Lees, per G.R.E.). Other records include 12 at Thirsk on December 29th, where they had been for some time (B. Foggitt); about 50 at Whitwell-on-the-Hill on December 17th (R. F. Wormald); two at Knaresborough on December 25th (R.H.); one at Haxby on December 29th (F.J.); and two at Harome feeding on holly berries throughout December (A. Gordon).

Waxwings continued to be seen in Scarborough, six on December 15th were eating berries of elder and guelder (A.J.W.); and in the Vale of Pickering, December 8th, two near Pickering (Miss S. Hall); December 16th, two again in Thornton Dale (J. T. Green); December 30th, five near Pickering, about 30 near Wrelton, and three at Sinnington (R.M.G., W.B.A., etc.). Four were still at Whitby on December 26th (A.B.W.). Berries recorded as used for food are berberis, cotoneaster, haw, holly, elder, guelder, yew, and apples remaining on trees. Insects are also recorded as taken. In Teesdale three Waxwings were killed by Sparrowhawks (G.A.E.); and several were taken by the cage-bird fraternity in the East Riding.

121. SPOTTED FLYCATCHER.—May 12th, at Denaby Flats in the Don Valley, was the earliest record (R.B., C.G.). Birds were at Spurn on May 27th and 28th, the first seen there (G.H.A.). The pair that usually nest in Mr. Foggitt's garden at Thirsk did not arrive until June 3rd. At Bolton Abbey birds that arrived on May 16th had 5 eggs on May 28th, which fledged on June 23rd; a second brood fledged on August 6th from four eggs which had been laid by July 12th (C.F.T.). A late pair were feeding fledglings at Hardcastle Crag on September 15th (G.R.E.). The last at Spurn was seen on September 21st (F.M.G., G.H.A., etc.).

123. PIED FLYCATCHER.—At Spurn was first noted on May 12th (J.R.W.) and last seen on October 1st (W.B.A., G.R.E.). A male had reached Harwood Dale by April 19th (A.J.W.). A male at Goathland was without black except on tail and without white on forehead (W.S.M.). A similar male occurred at Cropton (R.M.G.), and dark grey-brown plumage is not rare (R.C.). Singing cocks were plentiful in spring, 8 being noted within two miles of Kirkdale on April 24th and 25th, and 11 in the Beckhole district on May 4th and 11th (C.E.A.B.). Around Masham, 15 singing cocks were located, two of which failed to attract mates; on June 19th one cock was still singing above the hole I had seen him enter on several days, but on the 22nd he had gone. Birds in Wharfedale were normal (W.F.F., A.T.) and in Ryedale (E.W.T.).

125. RED-BREASTED FLYCATCHER.—A young bird was ringed at Spurn on September 29th (W.B.A., G.R.E. etc.).

126-127. GOLDCREST.—Four birds were near Swillington Ing on January 2nd, 1946 (J.K.W.). In the Bretton district, after being sparse in spring, a considerable increase was noted towards the end of the year (J.C.S.E.). More numerous in Duncombe Park in 1946 than for many years (A.G.). August 14th was the date of appearance of an early straggler to Spurn; from October 6th to 29th, the species was numerous there (G.H.A., R.C.). Two birds from Whitby (A.B.W.) and one from Thornton Dale (R.M.G.), both in November, were Continental Goldcrests (A. Hazlewood).

129. CHIFFCHAFF.—The earliest record comes from near Harrogate on March

30th (Rev. K.I.). The last bird on passage at Spurn was noted on September 29th (W.B.A., G.R.E.).

132. WILLOW WARBLER.—March 30th at Bretton Park (J.C.S.E.), March 31st at Well (near Masham) (R.C.); and April 1st near Harrogate (K.I.) are all abnormally early dates, and it is the first time I have known the species in Yorkshire before April. Everyone had recorded it before the corresponding first date for 1945, of April 7th (R.C.). Numerous on passage at Spurn, August 12th to 14th (G.H.A., E.N.). A late bird was seen at Spurn on November 3rd and 4th (E.C.), and one in lower Teesdale on November 6th (J.P.U.).

135. WOOD-WARBLER.—The first record came from Ilkley on April 19th (W.F.F.). Occurrences at Spurn were few—only one in spring on April 27th and a few in September, with the last on the 26th (F.M.G.).

145. GRASSHOPPER-WARBLER.—Earliest record at Methley on April 24th (P.B.), and at Hook Moor on April 25th (J.E.B.) Heard later in summer at Chapelton (W.E.H.), North Ferriby (Miss Pierson), Skipwith Common (2 pairs, E.W.T.), Staindale (R.M.G.), Gilling (Ampleforth Notes), and Nunthorpe district, where birds that had arrived by May 10th were believed to breed, two young birds being seen with an adult on June 28th (G.A.E.).

149. REED-WARBLER.—A small colony near Welwick makes the tenth known in the East Riding—those visited were up to average numbers. A fairly large number nested near Gilling Lake but there was an unduly high percentage of addled eggs, possibly caused by the excessive wetness of the summer months (Ampleforth Notes.)

153. SEDGE-WARBLER.—Was seen at Spurn and at Hornsea on April 23rd (J.R.W.), in the Vale of Mowbray on April 24th (J.P.U.), but had not returned to Clifton Ings on April 28th (E.W.T.).

161. GARDEN-WARBLER.—Was in lower Swaledale on April 13th (J.P.U.). A bird on September 30th (W.B.A., G.R.E.), was the only one noted at Spurn in autumn.

162. BLACKCAP.—Noted in the Vale of Mowbray on April 19th (J.P.U.), and near Bingley on April 21st (S.L. and H. Dibb). A bird on September 11th (R.C.), was the only Blackcap noted at Spurn in autumn.

163. COMMON WHITETHROAT.—A bird had reached the Vale of Mowbray by April 8th (D.U.); other dates were normal. On July 17th, an adult, attending a young bird some three weeks out of the nest, picked a white blob of excrement from under the juvenile and carried it a few yards before dropping it. This must have been from force of habit (W.S.M.).

164. LESSER WHITETHROAT.—Earliest record at Masham on April 24th (R.C.). Fairly numerous at Spurn August 12th to 14th (G.H.A., E.N.); where last seen September 21st (C.W.G.P., F.M.G., etc.).

173. FIELDFARE.—There were more May records than usual despite the forward immigrant season. Birds were seen near Masham, about 40 on May 3rd (R.C.); near Hebden Bridge, 27 on May 5th (E.W.W.); and one bird at Spurn (J.L., G.H.A., J.R.W.); and about 50 at Wawne (G.H.A., J.L.); about 12 at Beckhole on May 11th (C.E.A.B.); and near Sedbergh one bird on May 12th and 14th (T.R.T.). In autumn the first record came from Arthington on September 16th, when three birds were seen and heard (J.E.B.); 20-30 birds were at Sandal on October 8th (J.H.H.). Considerably fewer birds were evident in Yorkshire in the autumn of 1946 than in that of 1945, although there were many seen at Spurn (R.C.).

174. MISTLE-THRUSH.—A flock of seventy at Swillington Ing on November 30th was rather unusual (J.K.W.).

175. BRITISH SONG-THRUSH.—Several people refer to decreasing numbers of this species, to the presence of extremely few birds in some districts in winter, and to a partial recovery in spring. Mr. Ilderton says the species seems to disappear from Harrogate after October. Mr. Baldwin says the local Song-Thrushes of Methley have migrated now for two winters. Thirty years ago this species and *Merula* were generally considered equal in numbers. This winter my home trap has caught 8 Blackbirds, but only one Song-Thrush—the only one seen. The Spurn trap caught 65 Blackbirds, against 23 Song-Thrushes, and only on September 30th (W.B.A., G.R.E.) was the Song-Thrush numerous there. There would seem to be some evidence of a change in status that may still be in progress; and which calls for close observation and recording.

177. CONTINENTAL SONG-THRUSH.—A bird of this race that was found dead in Warren Cottage garden, Spurn, on March 31st, 1946, was sent to the Yorkshire Museum and identified by Mr. R. Wagstaffe. The body was lying close to a deserted, mud-lined nest. A male had sung regularly during the previous fortnight (G.H.A., J.L.).

178. REDWING.—Last seen at Spurn in spring on May 5th (G.H.A., J.L., J.R.W.). In autumn first seen there on September 29th (W.B.A., G.R.E.); and numerous there October 10th-12th (J.H.B., J.L., G.H.A.). Heard over Knaresborough on October 7th and seen on the 8th, with flocks of up to 50 birds following the Nidd Valley on the 9th (R.H.). Old Bramhope (T.R.T.), Wakefield (A.G.P.), Horbury (J.K.W.), Thornton Dale (R.M.G.), and other areas had experience of the same movement, but inland birds nowhere became really numerous until mid-October, and did not appear in the Vale of Mowbray until the 18th (J.P.U.); and it was October 28th before large flocks were seen on Tilmire (E.W.T.), at which date Redwings were still fairly numerous at Spurn (R.C.).

182. RING-OUSEL.—Noted in Swaledale (J.P.U.) and on Blubberhouses Moor (H. G. Williamson) on March 14th. Late birds were seen on the moors at Burley Woodhead on October 17th (W. Flesher), and near Masham on October 24th (P. Young). April 22nd was an early date for a nest near Gorpse (E.W.W.). Three were seen near Saltersgate on April 10th (W.S.M.). At Spurn a Ring-Ousel occurred on May 5th (G.H.A., J.L.). In autumn two occurred on September 30th (one caught and ringed), and one on October 3rd (W.B.A., G.R.E.).

184. BLACKBIRD.—A bird ringed in Belfast on January 28th, 1945, as adult by J. Cunningham was recovered at Harewood, Yorkshire on March 28th, 1946 (Miss E. P. Leach in *British Birds*). At Dewsbury, a Blackbird flew away from a robin's nest in ivy on a wall on June 6th. The nest contained five-days-old young. On the 9th the Blackbird was disturbed from the Robin's nest again, apparently brooding. There was a Blackbird's nest 4 yards away (J.R.). Almost always present in autumn in the bushes at Spurn, Blackbirds were especially numerous in late October (R.C.).

186. WHEATEAR.—Birds were seen on March 24th, at Spurn (G.H.A., J.L., J.R.W.); near Kirkby Malzeard (R.C.); in Swaledale (J.P.U.); and on Blubberhouses Moor (H. G. Williamson). Odd birds at Wetherby (R. F. Wormald), and on Tilmire (E.W.T.), both on May 4th, were still no doubt on passage. Appeared at Spurn again on July 27th (H.O.B.), numerous there on August 12th and 13th (G.H.A., E.N.) and last seen there on October 6th (W.B.A., G.R.E.).

197. WHINCHAT.—At Spurn first seen on April 27th (R.M.G., C.E.A.B.), and last seen on October 2nd (W.B.A., G.R.E.).

198. BRITISH STONECHAT.—A pair was seen on Baildon Moor on July 9th (S. Jackson). Only one bird was seen at Spurn on October 4th and 5th (W.B.A., G.R.E.). A bird at Scalby Mill on October 11th was the first seen in the Scarborough district since 1939 (R.M.G.).

201. REDSTART.—A cock was seen and heard near Masham on April 3rd, and a hen first seen on April 16th (R.C.). At Spurn first seen on May 11th (G.H.A.) by which date Yorkshire breeding Redstarts had been well established in their haunts for some time. Last seen there on October 25th (R.C., G.H.A.).

202. BLACK REDSTART.—Near Rotherham on June 23rd, Mr. F. G. Rippingale watched an adult male feeding a young bird recently out of a nest. An old farmhouse, tumbledown barns and old trees were all adjacent, but the hen and other young could not be located. At Spurn four were seen on October 19th and six on the 20th (J.R.W., G.H.A., E.C.).

218. DIPPER.—Near Masham a pair built a nest (one egg on March 28th) in an old petrol tin lodged above a little waterfall (R.C.). A Dipper, which for no apparent reason had been shot at Draughton on 29/11/46, proved to have been ringed at Bolton Abbey on April 27th, 1945 (Miss E. P. Leach, per A. Pilkington).

220. SWALLOW.—Early records were—at Masham, one on April 2nd; several over the river on the 4th, another over Masham on the 7th and no more for some days (R.C.). Early Swallows are also recorded, one at Ben Rhydding on March 27th (W. Flesher); two, on April 3rd at Castley (H. Marjoram); near Skipton, one on April 4th (A.T.); and two over Hornsea Mere on April 6th (E.C.). Movements proceed along the coast long after the Swallows of most inland localities have arrived and settled down. On May 20th and 21st, a continuous movement took place from the west down the Humber estuary and thence southwards along



the Spurn promontory; no doubt this was a fraction partway of a long journey (H.O.B.). On May 22nd a few birds were still passing north along Whitby East Cliff (A.B.W.). On May 28th, a southward movement continued all day at Goathland (W.S.M.). Again in autumn a pronounced southward migration at Spurn continued from August 30th to September 10th. The routes followed by birds from a number of countries may converge and separate again near to Spurn, and the same routes may not be followed each year. Swallows were last seen at Spurn on October 27th (R.C., E.C.), but near Wensley the species was seen on October 30th (Lord Bolton), and near Barnsley, whence most had left in late September, a bird was seen on November 3rd (W.E.H.).

222. HOUSE-MARTIN.—Three were seen near Wakefield on April 13th (J.H.H.). Fifteen nests were located on Kilnsey Crag (which probably held more) on August 4th (C.O., A.W.). The main southward movement at Spurn took place from September 16th to 27th. October 30th was a late date for birds near Wensley (Lord Bolton); and at Warter Priory (J.H.B.).

223. SAND-MARTIN.—The earliest appearances recorded were in Wharfedale, at Castley on April 1st (H. Marjoram), and at Ilkley and Ben Rhydding on the 3rd (K.C.C., W.F.F.). There were large numbers over Hornsea Mere on April 6th (E.C.). Mid-April was a more general time for arrival. On June 4th a bank of sawdust of a deserted saw-mill at Masham, to which Wm. Thwaites had drawn my attention, had ten borings with Sand-Martins flying in and out; a few days later, boys had dug them out (R.C.). On July 23rd, about 100 birds passed south near Wakefield (A.G.P.). The main southward movement took place at Spurn from September 19th to 24th; last seen September 27th (F.M.G.).

225. SWIFT.—Birds appeared unusually early; the first near Harrogate on April 29th (K.I.). On the 30th an odd bird appeared over Skipton (A.T.), two over Otley Chevin (K.C.C.), five at Esscroft (W.F.F.), and two near Masham (R.C.; E.H.), were the first I have ever seen in April, but it was May 10th before the main body of local Swifts began to prospect for crevices. (For detailed account of behaviour of Masham Swifts in 1946, see *The Naturalist*, January-March, 1947, p. 9). Birds in the thunderstorm of July 13th near Whitby flew in the rain with a shuffling movement as though taking advantage of the shower-bath (A.B.W.). T. Smith writes of large numbers passing west up the valley from Crosshills towards Colne during early August; on the 8th sixty passed in small parties during the afternoon. At Spurn a continuous stream passed southward all of June 28th (G.H.A., J.L.), and again on July 14th (H.O.B.), and August 11th-13th (G.H.A., E.N.). Late birds occurred at Flamborough on September 18th and at Spurn on September 19th (F.M.G., C.W.G.P.), and on October 5th (W.B.A., G.R.E.). An exodus of local birds took place from Thornton Dale on July 18th (R.M.G.).

227. NIGHTJAR.—The species was more plentiful in the York area than for years past, several pairs nesting about Skipwith Common (E.W.T.). Birds were noted below Ilkley Moor on June 21st (W. Flesher); several were seen and heard near Masham (R.C.), near Wakefield (J.H.H.), near Harden (S.L.), and near Chapeltown (W.E.H.). One occurred at Spurn on September 3rd (J.L., C.M.S.).

232. HOOPOE.—A bird was seen daily in the grounds of Mr. A. Nicholson, Stairfoot House, Adel, from April 22nd to 29th; Mr. A. Dixon, the gardener, gave me a perfect description of the bird, which allowed close approach (W.B.). Mr. Gregson, who is familiar with the species in India, watched a Hoopoe in a garden at Sleights in April (A.J.W.).

238. LESSER SPOTTED WOODPECKER.—Occurrences of the year have been near Masham on March 23rd (R.C.); in the garden at Willerby of Mr. F. R. Pearson, on August 9th; near Wakefield in March and October (J.H.H.); in the Bretton district where slowly increasing (J.C.S.E., J.K.W.); near Tadcaster on December 27th (A. Gilpin); in woods near Farnley Lake on March 31st and April 8th (J.E.B., T.R.T.); near Methley on April 12th (P.B.); at Wassand on January 5th, one drummed (E.C.); near York on March 31st (G.W.). A pair nested at Gilling (Ampleforth Notes).

239. WRYNECK.—In the York district on July 12th, General Sir Phillip Christison, who knows the species well in the East, watched an adult with 5 or 6 young as they flew over a lawn with undulating flight and alighted in a tree under which he was standing. The old bird was seen to take insects and to feed one young bird, the others seemed to be feeding themselves. A pair of Great Tits resented the presence of the Wrynecks. This species is seldom recorded in Yorkshire, especially as a breeder.



240. CUCKOO.—P. Baldwin reports one at Methley on March 31st, which a farmer at Crossgates heard half-an-hour later. April 14th at Bolton Abbey (C.F.T.), April 15th at Masham (R.C.) and Haxby (F.J.), and April 16th at Thirsk (B.F.), were all unusually early dates. Just outside a Willow Warbler's nest on June 8th in the Vale of Mowbray was one Willow Warbler's egg and a Cuckoo's (J.P.U.). Young Cuckoos were numerous on passage at Spurn on August 11th and 12th (G.H.A., E.N.), where it was last noted on August 20th (G.H.A., J.R.W.). A young bird was seen in the Vale of Mowbray on September 16th (J.P.U.).

249. LITTLE OWL.—Frequently seen at Spurn, nested at Easington and at Wawne (G.H.A. and J.L.). Seen by J. M. Brown in his garden at Robin Hoods Bay, several nests located in lower Teesdale, and many reports from central Yorkshire where the species has been long established. Lord Bolton reports it is becoming plentiful about Wensley. Two pairs nested in Wharfedale near Burley Woodhead (W.F.). Seen near Bolton Abbey and Skipton (A.T.); and in Upper Ribblesdale on September 2nd on higher ground than the species usually affects (C.A.C.). The spread of the species to the higher reaches of the Dales is now the main distributional feature of interest. At Nunthorpe remains of Whitethroat and Chaffinch were fed to a sitting hen (G.A.E.).

250. LONG-EARED OWL.—Nested in the Nunthorpe district but was robbed (G.A.E.). Formerly not uncommon in the Doncaster district is now seldom encountered (G.E.H.). In Houghton Woods the keeper reports moderate numbers (G.H.A., J.L.). A pair still breed near Wakefield (J.H.H.).

251. SHORT-EARED OWL.—Birds were seen in Tilmire, York on March 9th and December 24th (B.L.). Three young were ringed on moors near Halifax on July 12th (B. Astin). Behaviour of a pair in spring on the Yorkshire-Derbyshire boundary was suspicious of breeding (C.H.W.). A bird foraged over old sewagebeds at Knowthorpe near Leeds on March 21st (J.E.B.). Two quartered a field at Sutton (Hull), sweeping along a dyke, on August 30th (J.L.). On May 27th, at Spurn, a bird flew out to sea in a north-easterly direction (J.B., J.H.B.). H.O.B. saw a bird at Kilnsea on June 2nd and also saw the first bird of autumn on September 1st.

259. PEREGRINE FALCON.—A tiercel was seen in Low Staindale on January 16th (W.S.M.). Single birds occurred at Hayburn Wyke on August 11th and near Scarborough on October 3rd (A.J.W.), and at Bampton on October 1st (G.R.E., W.B.A.). One passed south over Thornton Dale on October 17th (R.M.G.). In the Spurn-Kilnsea area birds occurred on January 7th (G.H.A.), on January 27th (H.O.B.), and one was seen standing on a post on October 5th (B.B.). In the Dale country one bird had apparently been robbed, a second was sitting one egg on April 11th and on the 20th (A.W.). A tiercel was seen twice near Coverhead on August 5th; and on September 29th a Peregrine and a Buzzard 'played' in the air near Witton Fell (J.P.U.). Two birds occurred in the Halifax area in November (F.D.).

262. MERLIN.—As usual a number were seen at Spurn on various dates in September and October (G.H.A.).

263. KESTREL.—Near Sheffield a bird obtained sparrows by following them under an old pantile roof (W. S. Spencer). There was a pronounced southward movement at Spurn on September 15th (F.M.G., C.W.G.P.), and again on October 4th, when four flew from the point towards Lincolnshire (W.B.A., G.R.E.).

268. ROUGH-LEGGED BUZZARD.—A bird was shot at Goldsborough in March (G.A.E.), the victim of ignorance and prejudice. Single birds above the Masham-shire Moors on November 23rd and 29th may have been of this species (P. Young). A bird was seen near Bolton Abbey on November 16th (K.C.C.).

269. COMMON BUZZARD.—A bird that had been ringed as young near Sedbergh by the Sedbergh School on June 17th, 1945 was recovered near Barnard Castle on March 4th, 1946 (Miss E. P. Leach in *British Birds*). A bird soared over Methley on January 18th (P.B.) and one near York on October 6th and 7th (F.J.). The species was seen on several occasions above Swaledale and Wensleydale (J.P.U.) and above upper Ribblesdale (E.H.) and near Fewston in mid-June (W. Flesher). E.W.T. watched two birds near Kettlewell Point on April 19th. A buzzard occurred at Spurn on October 5th (W.B.A.).

271.—MARSH HARRIER.—A bird watched for 30 minutes at Cherry Cob Sands on May 10th had uniform dark plumage with a creamy-buff head, its companion was too far away for detailed observation (H.O.B.).

272. MONTAGU'S HARRIER.—Unidentified Harriers seen at Spurn on May 11th (G.H.A.) and on September 9th (R.M.G., R.C.) and at Waudby on August 23rd (L.S.), may have been of this species. Proof was only forthcoming of the breeding of one pair, which reared three young in the North Riding (R.M.G.).

273. HEN HARRIER.—A white-rumped bird near Kilnsea on October 20th was believed to be of this species (G.H.A., J.R.W.). Good views were obtained of a female at Swillington on November 2nd (J.K.W., K.D., J.E.B.), and at Spurn on December 1st (J.R.W., J.L., G.H.A.), and on Burley Moor on November 10th (W.F.).

277. SPARROWHAWK.—G.A.E. watched a bird chase a Starling into and out again of a thorn-bush, take it in mid-air, and then alight. When approached, the Starling and the Hawk both flew away. A bird was seen to leave Spurn Point and fly in the Lincolnshire direction on October 4th at the time of a pronounced southward migration of Kestrels (W.B.A., G.R.E.).

284. OSPREY.—Good views were obtained of an Osprey at Castle Howard Lake, on April 26th, by M.D. and R. Cobham (*British Birds*, November, 1946). A bird occurred at Hornsea Mere on July 4th (Mr. Childs). At Spurn on September 30th, an Osprey flew westerly across the Humber, after first being seen as it perched on the cliff-edge flagstaff (W.B.A., G.R.E.).

289. HERON.—The species holds its own. Occupied nests of 1946 have been—18 at Healaugh (W.B., E.W.T., W.G.B.), 14 in oaks at Harewood (W.F.F., W.B.), 33 on April 14th at Gargrave in oak with one in sycamore (W.F.F., K.C.C.), 8 at Hubberholme on April 14th, all in pines (W.F.F., K.C.C., and J.A.C.), 13 at Kiplin (J.P.U.), 20 at Hornsea Mere (G.H.A.), 7 at Moreby Park (E.W.T.), 11 at Gilling (Rev. V. Wace), 3, possibly 4 at Sleningford (16 birds, old and young seen in the air together on June 24th). Not previously included in the survey, this old heronry has latterly been much disturbed by timber felling. With less disturbances now, the owner (Mr. W. D. Arton) expresses the hope for the recovery of the colony (R.C.). Attempts to nest for the second successive year in the Goathland district were unfortunately frustrated by the owner (W.S.M.). At Swillington Ing, on June 1st, where the species is seldom seen in the breeding season, a heron alighted on deep water and swam to the shallows (K.D.).

297. BITTERN.—Single birds were shot near Fridaythorpe in January (F. R. Pearson) and on the Leven Canal on November 14th (T.E.R.). C.F.P. and E. Langford saw a Bittern at Cherry Cob sands on November 24th.

300. WHOOPER SWAN.—A bird at Gouthwaite Reservoir allowed a detailed inspection of its broad, lemon-yellow bill on February 11th (R.C.). Three were there on February 24th (G.K.Y., H.A.P.), but only one again on the 27th (R.C.). The whooping cry came from 6 birds at Walton Hall Lake on February 3rd; and a single bird remained on February 10th (J.K.W.). On December 27th at Semerwater, 18 Whoopers included two adults, accompanied by four young and one bird with two young, all were still there on January 1st, 1947 (R.C.). G. R. Pryor saw 17 on Redmires Dam near Sheffield on December 28th, five young birds were included. A bird was shot at Barnoldswick on December 31st (A. Pilkington).

301. BEWICK'S SWAN.—A herd circled over Thornton Dale in darkness on January 23rd and were identified by the single, high-pitched call (R.M.G. and J.T. Green). Twenty-seven passed south over Thornton Dale about noon on December 16th, being identified in the same way (J. T. Green),

302. MUTE SWAN.—At Swillington on March 24th, one of three called a deep bass 'U-braa' about every minute (K.D.).

303-307. GREY GESE.—Large flocks passed up Wensleydale in the week ended February 16th (J.P.U.). There were 45 at Gorpse Reservoir on February 13th (J.C.). On the same day about 30 flew up Wharfedale between Ben Rhydding and Burley (J. P. Busby) and were probably the same that passed near Skipton near to the same time (A.T.). 50-100 passed west from Thornton Dale on February 18th (R.M.G.). Thirty passed over Addingham Moorside on September 29th (Bradford N.S.). Passage south over Thornton Dale was noted on September 27th, November 26th and December 8th (R.M.G.). 25-30 passed over Hipperholme on November 8th (V.S.C.). About 30 flew west over Leeds on December 10th at 13 hours (M.F.M.M.). 50 passed west over Hebden Bridge on December 29th (E.W.W.). A skein of about 100 passed south-east over Huddersfield on December 31st (J.C.S.E.), and a flock of about 150 over Sproxtton about 4 p.m. on December 31st (E.W.T.). Three skeins passed south and one west up the Humber from Spurn on November 2nd (E.C.).

303. GREY LAG GOOSE.—A single bird was at Hornsea Mere on January 20th and one at Spurn on May 5th (G.H.A., J.L.). About 70 Canadas on Ripley Ponds on November 22nd were accompanied by a Grey Lag and a smaller, dark-headed, small-beaked goose, which may have been a pink-foot (K.I.). There were 40 on Gorpel Reservoir on January 27th (E.W.W., D.M.).

304. WHITE-FRONTED GOOSE.—Three birds flushed from a pool near Keighley on March 26th, were subsequently watched from behind a wall at 25 yards range and showed strong breast-bars (T. Smith). Close views were obtained of five birds at Cherry Cob Sands on March 3rd (C.F.P.). A bird was shot near Scarborough during December (E.W.T.).

307. PINKFOOTED GOOSE.—Twelve were identified at Kilnsea on January 27th (H.O.B.). 27 flew up the Humber from Spurn on October 5th (W.B.A., G.R.E.). A skein of 90 birds flew south-easterly at Hildersley on October 20th at 12-15 p.m. On November 10th, Pinkfeet over the Humber, numbering some 2,750 birds came down to the mud-flats in five minutes. Leading skeins began to 'whiffle' on sighting the mud-flats (R. F. Wormald). A bird in a poulterer's shop at Ilkley on December 10th had been shot at Malham (R. F. Graham).

314. CANADA GOOSE.—This bird is a normal feature of the countryside about Masham from the stock introduced to the Swinton Park lakes many years ago. They also now nest by reservoirs in the district and range far especially in the winter months (R.C.).

315. SHELD-DUCK.—First seen in spring at Spurn on February 24th (H.O.B.). Twenty-seven were seen on April 28th (R.M.G., C.E.A.B., J.R.W.), and fifty at Cherry Cob Sands on April 15th (J.R.W.). Bred as usual on the Humber-side. There was a juvenile on water near Wakefield on August 17th and a drake and duck at Winterset Reservoir on December 15th (A.G.P.). At Hornsea Mere there was a juvenile on September 1st (J.L., C.M.S.), and at Eccup, two on December 15th (H.W.); and a bird at Coniston Cold on May 31st (R.T.).

317. MALLARD.—Unusually numerous at Hornsea Mere on November 19th and subsequently (G.H.A., J.R.W.), the keeper Mr. Childs said they had not had so many for years. Numbers at Swillington Ing have been far fewer than was the case some years ago (A.G.P.). The congregations at Leighton Reservoir continued to number about one thousand except in spring and summer (R.C.). At Eccup, birds increased to about 500 by late December (H.W.).

318. GADWALL.—A pair 'up-ending' at Swillington on April 22nd showed the white speculum (K.D.). A pair at Hornsea Mere were noted throughout the breeding season and up to September 1st (G.H.A., J.L.).

319. TEAL.—A bird ringed at the Orielson Decoy, Pembrokeshire, on January 9th, 1938 was recovered near Horton-in-Ribblesdale on November 25th, 1945. Fairly numerous at Swillington Ing through most of the year, this species was not observed there during the breeding season (K.D.).

322. GARGANEY.—A drake was seen at Hornsea Mere on April 3rd (J.R.W.). A drake occurred at Bottomboat, Wakefield, on May 22nd (A.G.P.). At Swillington a duck and a drake were present on May 25th (A.G.P.); on the 29th a second drake was also there, but had gone by June 1st and remained away until the 22nd, when three birds were seen again and remained until August 18th, on which date another duck (making 4 birds) was present (J.K.W., A.G., J.E.B., etc.).

323. WIGEON.—May 18th and 22nd are late dates for 8 Wigeon to be at Swillington Ing (J.K.W.). Birds were present near Spurn from October in fair numbers, 83 being counted on October 25th (G.H.A., R.C.). Numbers eventually reached some 350 birds during December. Varying numbers were present during the late autumn at Swillington Ing, Gowthwaite Reservoir, Winterset Reservoir, Ripley Lake, Castle Howard Lake, Hornsea Mere, etc. (K.D., J.K.W., A.G.P., E.W.T., R.C., G.H.A., etc.).

325. PINTAIL.—Occurred inland in small numbers at Swillington; Redmire's Dam, Sheffield; Hornsea Mere; Stone Creek, etc. (K.D., A.G.P., J.K.W., G.F.P., C.H.W., etc.) at both ends of the year.

326. SHOVELER.—A pair had eleven small young at Swillington Ing on May 29th (J.K.W.). The species was observed on other waters on various dates.

328. COMMON POCHARD.—Was seen on most suitable waters during the year, with the largest numbers on Hornsea Mere where bred (G.H.A., J.L.).

330. TUFTED DUCK.—A bird ringed in St. James' Park, London, as adult by the London N.H. Society on December 20th, 1945, was recovered at Castleford



on May 29th (Miss E. P. Leach in *British Birds*). Three broods were reared on the Bretton Park Lake (J.C.S.E.) and three pairs bred at Swillington Ing (K.D., J.K.W.), where three immigrant flocks flew in on November 9th. The species is reported from most waters. On the Nidd near Ripley about 600 were present on January 17th during severe weather (K.I.). At Winterset on January 20th a larger number were present (J.H.H.). Many waters were then frozen.

331. SCAUP.—A duck was in Scarborough Harbour during February (A.J.W.), and on Hornsea Mere on January 20th (G.H.A., J.L.). Two occurred at Swillington on February 10th (V.S.C., H.F., etc.). On May 27th a pair visited the Morley Pond, Wentworth (T.M.F.). Autumnal records inland are—2 drakes and 2 ducks at Gouthwaite on October 31st (K.I.); one on October 5th (H.W.); and six at Eccup Reservoir on November 10th (A.G.); a duck at Winterset on August 23rd (J.R.); a drake at Swillington on October 22nd, and a duck on several days in November (J.K.W.). One at Gorple Reservoir on October 13th (E.W.W.). September 1st was an early date for a drake on Hornsea Mere (J.L., C.M.S.). A 'raft' of over 250 birds was seen on the Humber near Spurn during December (J.H.B., J.R.W., G.H.A.).

332. GOLDENEYE.—At Hornsea Mere from January 12th to 20th, numbers increased to about 12. Copulation was seen on February 17th, much display on March 16th, and one bird on May 1st (G.H.A., J.L.). At Gouthwaite Reservoir, where six were seen on January 5th, several drakes were in full plumage on March 24th, accompanied by mates (R.C.). In the early part of the year up to 15 lived on the Wharfe near Otley (W.F.F.). A pair was still on Chelker Reservoir on May 16th (A.T.). A few were generally to be seen at Swillington in the winter months, at both ends of the year (A.G.P., J.K.W., K.D.), and pairs and odd birds were seen on Farnley Lake (H.M.); Ripley Lakes (K.I.); Redmires Dam, Sheffield (G.R.P.); Coniston Cold Lake (R.T.); and at Spurn, three drakes on March 31st (H.O.B.), and one at Ferriby on December 7th (G.G.). Six were on Castle Howard Lake on December 25th (E.W.T.), and thirteen at Eccup on December 21st (H.W.).

334. LONG-TAILED DUCK.—There was an immature male at Spurn on May 27th (J.B., J.H.B.).

337. EIDER.—On March 24th, a pair swam off-shore near Scarborough (D.E.S.) and a pair was seen at Sewerby on March 27th (H.O.B., R.G.W.). A duck was seen at Spurn on several days between September 16th and 27th (C.W.G.P., F.M.G.).

339. COMMON SCOTER.—Two adult drakes were present on Winterset Reservoir on March 24th (J.K.W.). On April 27th a pair swam on Leighton Reservoir (R.C.). 30 were close inshore at Sewerby on April 21st (C.H.W.). At Spurn a flock of 70 were observed on August 31st (J.L., C.M.S.); and again on September 11th (R.C.). An odd drake at Gouthwaite on September 26th showed the orange on his bill (K.I.). At Swillington Ing about 112 on November 9th were very restless after flying in and departed westerly after three hours (J.K.W.). One occurred on Widdop Reservoir on August 18th (E.W.W., G.R.E.).

340. VELVET SCOTER.—One was seen at Spurn on August 31st (J.L., C.M.S.) and again on September 11th (R.C.); and one at Scarborough in March (G.W.).

342. GOOSANDER.—An odd bird occurred on Swinsty Reservoir on January 6th (H.J.W.); four on the Ure near Wensley on February 8th (Lord Bolton); twelve at Eccup on March 10th (H.F., I.M., F.M., V.S.C.) included both sexes. Two drakes and three ducks were on Leighton Reservoir on March 17th, and one drake with two ducks on Gouthwaite Reservoir on November 23rd (R.C.), where A. Pilkington had seen a duck on the 11th. Six ducks and four drakes had returned to Eccup by December 24th (A.G.). J.E.B. saw a duck on Lindley Reservoir on December 30th. There were two ducks on the Rivelin Dam, Sheffield, on December 29th (G.R.P.). A duck and a drake frequented Hornsea Mere during December (J.R.W., E.C., D.U., G.H.A.). E.W.T. saw a drake on Castle Howard Lake on December 25th, where it appears to have been since November 27th (Ampleforth Notes) and where R.M.G. had seen three 'redheads' on November 9th. An adult drake occurred on Thornton Marshes on December 28th (R.M.G.). At Eccup the first party of four drakes and one duck arrived on December 8th (H.W.) and 12 at Coniston Cold on the 26th (R.T.).

344. SMEW.—Three drakes and two ducks were noted at Swillington on January 13th (K.D.), and on February 2nd (J.K.W.). On February 10th there were five drakes and one duck visible (H.F., I.M., F.M., V.S.C.). Single birds occurred at



Gorple from January 20th to March 17th (E.W.W., D.M.). At Hornsea Mere on January 5th, three drakes were present (E.C.); on January 12th, there were three ducks and one drake, which had been joined by two ducks and another drake on the 20th; on February 10th only one drake was visible, with pairs on March 16th and April 3rd (G.H.A., J.L.). A male was present at Hornsea on December 15th (G.H.A., J.R.W.), and two drakes and a duck on December 24th (C.H.W.), on which date a female was shot (C.F.P.).

346. CORMORANT.—Birds occur regularly at Hornsea Mere in the winter, 20 being present on January 12th. Two trees at the edge of the mere are used as roosts. Two birds on February 27th showed the white patches on the flanks of the breeding season (G.H.A., J.L.). On April 22nd, 16 birds were counted at Ravenscar when building was in progress and 24 nests were occupied on May 25th at Gristhorpe Bay (A.J.W.). The colony at Huntcliff near Saltburn is fairly large (D.C.H.). Thirty were seen rising in V formation south of Spurn on October 1st (W.B.A., G.R.E.). There were 19 in a party on Hornsea Mere on December 12th (J.R.W., G.H.A.).

349. GANNET.—A note not sent in for 1945 should be included. On July 31st, 1945, two adults flew into the cliffs repeatedly at Bempton at the same place, which could not be inspected, staying for periods of from 5-15 minutes (J.H.B.). On July 12th and 13th, 1946, birds were seen five times along the same Yorkshire cliffs, once two birds together, but the natives had no proof of breeding and no sitting bird could be seen from land or sea (C. Lilleyman). At the same place J. H. Barrett saw the birds on April 22nd, 1946, May 25th, and August 5th, but although one bird apparently flew into the cliff, the exact spot was invisible. Birds were frequently seen passing Spurn southward, on the morning of September 9th passage was continuous. Three adults were in the estuary near Kilnsea on January 13th (H.O.B.). An adult followed a fishing boat off Scarborough on December 29th (R.M.G.).

368. FULMAR.—First seen frequenting Scarborough Castle Rock on January 13th (A.J.W.), where in early January there were 40-50 birds (E.M.R.). Between Bempton and Flamborough there were more than 100 birds on January 15th (J.H.B.). Two pairs were flying about the previous year's breeding site at Sewerby on February 17th and had become 10 pairs by March 24th. On September 1st there was only one bird (C.H.W.). Birds were also seen north of Runswick Bay, six on April 19th and twelve south-east of Whitby on April 21st (E.W.T.). On April 27th small parties appeared over the Humber near Spurn (R.M.G., C.E.A.B.). A bird near Whitby High Lights was seen to move an egg into position on May 25th (C.E.A.B.).

370. GREAT CRESTED GREBE.—The spring census revealed some 87 birds in the county, of which 25 pairs were known to breed. At Hornsea Mere there were four birds on January 12th and some display took place; nine on February 27th and March 16th; and sixteen on May 1st. Two were there on December 15th (G.H.A., J.L., J.R.W.). Fairburn Ing showed 20 birds on June 9th (A.G.P.). The remaining birds occurred on twenty sheets of water. In 1931 the late H. B. Booth's enquiry showed 65 pairs on 24 waters, and two non-breeders. Changed conditions due to the war are probably responsible for the apparent decrease and I suggest we continue to record the species.

371. RED-NECKED GREBE.—On February 27th, 1946, on the river Calder and adjacent canal near Mytholmroyd, a large grebe showed a yellow bill, a thick-set appearance and a black cap that came down to eye-level. It was there for several days (W. Greaves). A bird of this species was picked up, storm driven, but uninjured, at Bridlington on December 21st (C. H. Wells).

373. SLAVONIAN GREBE.—A bird was seen in Scarborough North Bay on December 22nd (A.J.W.), and in Scarborough Harbour on January 4th, 1947 (A.J.W.).

374. BLACK-NECKED GREBE.—A single bird was seen at Swillington Ing on January 5th (J.K.W.) and three on April 21st (I.M., V.S.C.). On May 25th there was a pair in breeding plumage (J.K.W.). On May 18th, on water a number of miles distant a bird sat on a nest and had a mate swimming nearby, a week later to be disturbed by an egg-raiding party, and soon after the area was deserted. But during August and September, up to three birds were seen on several occasions (A.G.P.). At Swillington on July 28th, eight birds showed breeding plumage (K.D.). On another water in the area on September 8th, two pairs of adults, still

in partial summer plumage had eight well-grown young (K.D.). Young birds and adults, varying from single birds to three, were seen in the area on various dates in September and October by independent observers (J.K.W., P.B., K.D., A. Gilpin, J.E.B.), and it is clear that breeding occurred and young were reared despite the numerous handicaps entailed in that district.

376. GREAT NORTHERN DIVER.—When out fishing from a boat, C. Lilleyman saw a bird in Bridlington Bay on September 29th. Seven of a party stated to be of this species visiting Hornsea Mere on March 1st were shot—a deplorable deed. (C.F.P.).

379. RED-THROATED DIVER.—A bird was watched at close range on Hornsea Mere on February 27th (G.H.A., J.L.), and three were there on December 15th (J.R.W., G.H.A.). A bird was picked up dead at North Dalton on December 20th (J.H.B.). Birds were noted off Spurn between September 7th and 30th (C.W.G.P., F.M.G., and others), and there were four off Spurn on December 28th (J.H.B., G.H.A.).

380. WOOD PIGEON.—About a thousand birds at Hornsea Mere on December 15th were probably immigrants (J.R.W., G.H.A.).

383. TURTLE DOVE.—A bird at Lowthorpe on May 5th was the earliest recorded (H.F.W.).

386. BAR-TAILED GODWIT.—Birds occurred inland at Swillington Ing on April 28th (A.G.P.), August 17th (J.E.B., G.T.) and August 21st (J.K.W.); at Eccup, one on September 27th (H.W.); on floods in the Vale of Pickering on October 1st (R.M.G.) and on Read's Island on October 13th (R.F.W.). At Spurn in September and October the maximum number seen was 36 on September 27th (F.M.G.), and the first bird of autumn was a juvenile on July 7th (H.O.B.). On December 17th a flock numbered 150 birds (J.R.W.).

387. BLACK-TAILED GODWIT.—Two at Swillington on May 12th, showed feet conspicuously projecting beyond their tails and were in almost complete breeding plumage (A.G.P., K.D.). Single birds were recorded at Spurn on June 28th (G.H.A., J.L.) and November 2nd (E.C.). On May 29th two birds at Cherry Cob Sands were still in winter plumage (H.O.B.).

388. CURLEW.—A bird ringed as young at Bolton-by-Bowland on June 22nd, 1938 by Dr. R. Carrick was recovered in County Cork in September, 1946 (Miss E. P. Leach in *British Birds*). Always present at Spurn, on April 7th small parties were leaving Kilnsea in a north-easterly direction (H.O.B.), and on April 28th about 20 flew out to sea in formation against a head wind and rain (J.R.W.). That the largest flock of the year there (about 100 birds) should have been seen on June 9th seems rather curious (Y.N.U. Meeting). There were 200 on Cherry Cob Sands on April 15th (J.R.W.). On September 29th, near Barnard Castle, 300 birds (F. K. Beaumont), and near Settle, on flooded fields, 600 birds on the same date (C.O., A.W.) seem to be remarkable inland congregations. Four flew over Swillington Ing, up Airedale, on August 21st (J.K.W.).

389. WHIMBREL.—Birds using the Whimbrel call passed near Wakefield at 11-45 p.m. on May 4th (A.G.P.), and one over Horbury at 8-55 p.m. on August 10th (J.K.W.). These birds were probably Whimbrels, but migrating Curlews not infrequently use a similar note. Three birds flew south over Bridlington on August 13th (G.H.A.). At Spurn odd birds were seen on April 22nd and 23rd (G.H.A., J.R.W., H.O.B.), and were recorded from July 14th to October 30th, with maximum of about 50 on October 10th (J.H.B.). Odd birds occurred on Whiteholme Reservoir on August 17th (E.W.W.), and at Swillington Ing on October 5th and 22nd, the last bird flying westerly (J.K.W.).

393. WOODCOCK.—Six were flushed in woods near Hornsea Mere on February 27th (G.H.A., J.L.). Nests were found with one egg near Masham on April 12th (R.C.) and with four in Houghton Woods on April 14th (J.L., G.H.A., J.R.W.). A bird was flushed at Spurn on May 5th (G.H.A., etc.). As I ringed two young birds near Masham on July 8th, keeping an eye on a third, which had run some 10 yards away on bare ground under firs and squatted, an old Woodcock came down through the trees to the chick and was up and off again immediately, carrying the young bird with it (R.C.). An adult in Wharfedale, on May 5th, was seen to carry a young bird away between its legs by W. F. Fearnley and several others, two other young flew away at the same time. First noted in Autumn at Spurn on October 6th, one bird (J.H.B.). Woodcocks were well distributed along the peninsula on October 29th and 30th when I flushed seven (R.C.).

398. JACK SNIFE.—Several were seen at Keld Head on January 4th (E.M.R.). Single birds were flushed at Spurn on April 7th (J.R.W., J.L., G.H.A.), and on September 28th (F.M.G., J.L., E.C., G.H.A.). First seen at Keld Head in autumn on October 16th, but were less numerous than in the past two years (R.M.G.).

402. TURNSTONE.—Three birds at Swillington Ing on May 11th were turning over cakes of dried mud (K.D., G.W.W.). Two were there on May 25th (A.G.P.). Present at Spurn throughout most of the year (G.H.A.).

403.—KNOT.—A bird occurred at Swillington Ing on October 22nd (J.K.W.).

404. SOUTHERN DUNLIN.—Bred on Ilkley Moor, at least one chick with parents on June 16th (W.F.F.). Numbers up to 30 were seen frequently at Swillington Ing in August, September and October (K.D., A.G., A.G.P., etc.). At Spurn almost always present in numbers normal for the season (G.H.A.).

406. CURLEW-SANDPIPER.—Birds occurred inland in the Vale of Pickering, one on October 1st (R.M.G.); at Swillington Ing, two on August 24th (J.E.B.) and 26th (H. Creswell, D. Archer, J.E.B.); and at Dewsbury Sewage Farm on September 5th (J.K.W.). Noted at Spurn, September 5th to 9th (R.M.G., R.C., C.E.A.B.), and a party of five on October 28th (R.C.).

407. LITTLE STINT.—Single birds were noted at Spurn in September (C.E.A.B., R.M.G., and others), and eleven on October 11th (W.B.A., G.R.E.). Birds occurred inland in the Vale of Pickering, one on October 1st (R.M.G.); at Swillington, two on October 6th, with a Dunlin (K.D., A.G.P.); six at Dewsbury Sewage Farm on September 5th in company with three Curlew-Sandpipers. Sixteen at Swillington Ing on October 3rd were accompanied by two Dunlins. Two were seen on October 30th and 31st, and one on November 2nd and 4th (J.K.W.).

415. PURPLE SANDPIPER.—20-30 were at Bridlington on January 20th and February 17th, and returned in autumn on November 26th (C.H.W.). A single bird was seen at Spurn on September 16th (C.W.G.P., F.M.G.).

416. SANDERLING.—Present at Spurn during most of the year with the greatest number 40-50, on May 27th (J.B., J.H.B.). A bird occurred at Swillington Ing on October 31st (J.K.W.).

417. RUFF.—Two at Knowsthorpe on April 7th showed no frills (J.E.B.). Birds were seen at Swillington, one on April 17th (J.K.W.), three on August 17th (G.T., J.E.B.), one on August 18th (A.G., K.D.), two on October 16th, four on October 23rd, one on October 24th, five on November 10th (J.K.W.). One occurred at Eccup on September 7th (H.W.). In the Vale of Pickering six were on flooded land on September 28th and at least twelve at the same place on October 1st (R.M.G.). At Spurn an odd bird showed itself to several people on September 5th and for several days (R.C.). Four were on Cherry Cob Sands from August 19th to September 29th (H.O.B.).

421. COMMON SANDPIPER.—Seen along the Wharfe near Bolton Abbey on April 13th (E.W.T.); first arrived near Masham on April 14th (R.C.). Usually to be seen at Swillington Ing from early August to late September in small numbers with twenty on August 5th (K.D.). First noted at Spurn in autumn on July 13th (H.O.B.), maximum five on September 30th (W.B.A., G.R.E.), and last date seen October 19th (E.C.). At Hessle on the Humber foreshore there were eight on August 7th, and fewer on several other dates (E.C.).

423. WOOD SANDPIPER.—Four flushed at Cherry Cob Sands on May 10th, showed darker tails than those of Green Sandpipers and greyer underwings, their notes were high-pitched, short but running into a ripple (H.O.B.).

424. GREEN SANDPIPER.—Wintered at Bretton Park, near Huddersfield 1945/46; one of two birds seen on February 9th obtained a worm about  $4\frac{1}{2}$  inches long from a small stream entering the lake over mud, which it carried into the lake and washed for some four minutes before swallowing (J.C.S. Ellis). A bird was seen at Farnley Lake on April 8th (J.E.B.). Autumnal records began at Swillington Ing on July 8th (J.E.B., N. Hepper), and up to five were seen on many dates in August and September (V.S.C., A.G.P., I.M., F.M., L.B., J.K.W., K.D., A.G., H.C., D.A.). At Osset Spa two birds exhibited courtship flight on April 14th, where birds were seen on other dates in April and in Autumn (J.K.W.). One occurred on the Derwent near Ganton on March 31st (A.J.W.). Single birds were seen many times at Kilnsea Beacon and Spurn from July 20th (H.O.B.) to September 30th (W.B.A., G.R.E.). A party of four were on the Kilnsea mudflats on August 5th (H.O.B.).

428. REDSHANK.—Maximum number recorded at Spurn was 150 on September



8th (R.C., R.M.G., C.E.A.B.). Drainage east of Doncaster had caused a decrease in the numbers of breeding Redshanks (G.E.H.).

431. SPOTTED REDSHANK.—Single birds were recorded at Spurn on August 20th (G.H.A., J.H.B.), and on September 12th (R.C.). Probably not more than two or three birds occurred at Swillington Ing in autumn, but they showed themselves and called for the benefit of several observers (K.D., J.E.B.; A.G.P., J.K.W.) on a number of dates from September 25th to November 16th. One bird on November 10th gave the low gruff call mentioned in the Handbook as occasional (A.G.P.). A bird inspected on November 9th showed more traces of breeding plumage than a bird seen on November 7th (J.K.W.).

432. GREENSHANK.—A bird occurred by Darfield Flash on April 4th (T.M.F.). a bird occurred at Swillington Ing on May 18th (J.K.W.) and 19th (K.D.), and birds were noted on a number of dates from August 5th (J.K.W.) to October 27th (K.D.), the greatest number seen being seven on September 15th, more frequently only an odd bird was seen, mud being scarce and the water level high. At Ectup a bird was seen on August 26th (H.W.). At Gorple Reservoir there were two on September 1st and 8th (B. Astin, E.W.W., G.R.E.), and at Bottomboat, Wakefield, on September 8th (A.G.P.). Odd birds were recorded near Spurn on August 16th, 17th and 18th (J.H.B., H.O.B.) and on October 2nd (W.B.A., G.R.E.).

435. RINGED PLOVER.—Seven were seen in a York field at 9 a.m. on October 1st (L. Carr). Small numbers occurred at Swillington Ing on various dates, including one on May 5th and 26th (K.D.), and seventeen on October 6th (K.D., A.G.P.). Two were at Bottomboat, Wakefield, on May 21st and 22nd (A.G.P.). Breeding at Spurn was normal (G.H.A.).

441. NORTHERN GOLDEN PLOVER.—Two birds at Welwick on June 9th had black faces, throats and underparts, with white margins, and axillaries showed white in flight (H.O.B.). A large flock near Danby Beacon on April 21st had very dark throats and breasts (E.W.T.).

440-441. GOLDEN PLOVER.—On October 5th a field near Skipton held some 450 Golden Plovers with a smaller number of Lapwings (C.O., A.W.). An odd bird above Masham on November 29th was late on the moors (P. Young per R.C.).

444. GREY PLOVER.—Two were at Bridlington on January 20th (C.H.W.). On May 21st, two at Bottomboat, Wakefield, were in full breeding plumage and there was one at Swillington on May 25th (A.G.P.), and four on September 28th (K.D., J.K.W.). At Spurn there were Grey Plovers to be seen at most times of the year with 30 on April 22nd as the largest flock (G.H.A., H.O.B., J.R.W.).

449. LAPWING.—A bird ringed by C. Oakes at Great Mytton as young on July 6th, 1938 was recovered at Ormskirk (Lancs.) on January 1st, 1946 (Miss E. P. Leach in *British Birds*). The habit of Black-headed Gulls of stationing themselves about a scattered, feeding flock of Lapwings, and of pouncing on any Lapwing immediately it pulled out a worm was observed on November 18th in the East Riding (J.R.W.) and near Northallerton in December (R.C.). Breeding birds continue to decrease. Immigrant flocks in autumn remain large (R.C.).

452. BRITISH OYSTERCATCHER.—In the breeding season pairs were observed inland, near Aysgarth on June 27th (R.M.G.); on the Swale near Ainderby on June 22nd (R.C., J.P.U.). At Sawley (Ribblesdale) on July 16th, an adult was accompanied by a young bird and the species continues to nest by the Aire near Gargrave (A.P.). On August 10th a flock of 50 birds was close inshore at Bridlington (C.H.W.), and 15 were seen near Thornbury flying towards Leeds (K. Fenton). Three pairs attempted to breed at Spurn and near Kilnsea, one of them successfully (H.O.B.); flocks of 40 on June 10th and on September 28th were the largest parties seen (G.H.A., J.L., R.C.). Small parties were in Scarborough South Bay at frequent intervals throughout the year—an unusual feature (A.J.W.).

462. BLACK TERN.—Of six birds at Swillington Ing on May 11th, none was in full adult male plumage (G.W.W.). Two were seen at Winterset Reservoir also on May 11th (A.G.P.). A bird occurred at Gorple Reservoir on August 18th (E.W.W., G.R.E.).

467. SANDWICH TERN.—Four birds were seen at Spurn on May 19th (H.O.B.) and three on June 8th (Y.N.U. Meeting). Recorded on various dates from August 13th to October 2nd at Spurn.

469. COMMON TERN.—Two birds were at Spurn on June 8th moving north (Y.N.U. Meeting). Terns of this or the Arctic species were recorded in autumn from July 21st to September 21st (G.H.A.). Two Common or Arctic Terns were



over Bottomboat, Wakefield, on July 14th (A.G.P.). A single bird flew west near Cowling on August 3rd (T. Smith).

470. ARCTIC TERN.—A bird at Swillington Ing on June 16th hawked and stood on a stone (A.G.P.), and one was seen at Gorple on August 11th (E.W.W.). Four birds were identified at Spurn on September 3rd (J.L., C.M.S.). Terns of this or the common species passed Spurn on various dates from July 21st to September 21st (G.H.A.).

471. LITTLE TERN.—The nesting colonies at Spurn began in good numbers, 40 nests were inspected on June 2nd (G.H.A., J.L.). First recorded in spring on April 22nd (G.H.A., J.R.W., H.O.B.) and last seen on September 6th (R.C., R.M.G., C.E.A.B.). They were much disturbed by picnickers and high tides destroyed some nests and insufficient young birds were reared at a rate to maintain the colony for very long. It is hoped to be able to afford more efficient protection in 1947, but the use of the road by cars makes the problem rather difficult. A nest on the Yorkshire side of Teesmouth on May 14th is reported by E. Jones (O.C.H.).

478. BLACK-HEADED GULL.—Eggs are still taken extensively from the scattered moorland colonies and at Skipwith, where about 150 birds nested. A bird recovered at Swillington on December 27th, by K. Brown, had been ringed in West Jutland on July 5th, 1946 (H.W.).

481. COMMON GULL.—There were about 200 in a field at Kilnsey, Wharfedale, on April 14th (K.C.C., J.A.C., W.F.F.), and 56 in pastures near Kilnsey on August 4th (C.O., A.W.).

484. SCANDINAVIAN LESSER BLACK-BACKED GULL.—Two birds at Fairburn on February 11th had plumage as dark as that of Greater Black-backs. About 70 at Eccup Reservoir on November 10th were all of this race (A.G.).

485. BRITISH LESSER BLACK-BACKED GULL.—Six at Lindley Reservoir on December 1st were all of this race with light mantles (M. F. M. Meiklejohn). Four at Bretton on February 23rd, travelling east-south-east, were this race; and two on the lake on May 25th (J.C.S.E.).

486. GREAT BLACK-BACKED GULL.—Birds occurred at Winterset and Swillington Ing and Eccup Reservoir on various dates in late autumn and winter (K.D., A.G.P., J.R.W.), with ten as the largest number—Eccup, December 24th (A. Gilpin). Always present at Spurn, most numerous August 12th to September 15th. Passage south continuous on August 31st (J.L., C.M.S.); and on September 28th (J.L., G.H.A.).

487. GLAUCOUS GULL.—Up to four immature birds were about Scarborough Harbour from November 9th (A.J.W.); five were there on November 28th (R.M.G.) and an immature bird was seen at Upgang, Whitby, on December 15th (C.E.A.B.). At Spurn a mature bird was seen on January 7th (G.H.A.), three immature birds on February 9th (J.R.W., G.H.A., J.L.), and one on April 7th (H.O.B.). A bird without black on primaries of same size as Herring Gull may have been a small Glaucous or an Iceland Gull (G.H.A., J.R.W.).

491. GREAT SKUA.—A bird was seen at Spurn on September 21st (G.H.A., J.L., F.M.G.), and on August 18th (H.O.B.). [The large size, brown plumage, dark bill and legs of a visitor to Swillington Ing on October 27th decided K.D. and A.G.P. that it was this species. When alighted on water it often kept its wings partially raised. The gulls present obviously distrusted it]. Absence of mention of the very noticeable wing pattern of this species causes an element of doubt in my mind, hence the square brackets (R.C.).

492. POMATORHINE SKUA.—The twisted tail of a bird at Spurn on September 15th was duly noted (C.W.G.P., F.M.G.); H.O.B. records one there on May 18th, and J.L. and G.H.A. saw another at Kilnsea Beacon on September 28th. A tired bird at Eccup on November 16th, which gave good views, was thought to be an immature bird of this species (H.W.).

493. ARCTIC SKUA.—Recorded at Spurn on August 12th (G.H.A., E.N.) and odd birds up to September, with five passing on September 17th (C.W.G.P., F.M.G.). A bird was seen at Read's Island on November 10th (R.F.W.).

504. CORNCRAKE.—Birds were recorded at Semerwater where seen and heard (J.P.U.); at Austwick, where heard for some time from June 10th (C.A.C.); at Fulwood, Sheffield, on July 1st (C.H.W.), and near Thirsk by two people on May 29th and confirmed personally on June 26th (B. Foggitt). A bird called near Ben Rhydding on June 2nd (H. G. Williamson). A bird was killed at Walton by a horse-drawn rake on September 28th (J.H.H.). Dr. K. C. Crosbie shot one that

came over with partridges on October 5th, near Bolton Abbey. From the absence of grey above the eye and of barring on the flanks, it was thought to be a young bird.

507. **LITTLE CRAKE.**—On December 28th at Spurn G. H. Ainsworth and J. H. Barrett had views at five yards range of a small rail-like bird with chestnut-brown wing-coverts and dark centres of feathers; flanks, throat, chest and sides of neck were uniform slate-grey, legs apparently grey, short green bill except near the base. The only note heard they describe as a 'sudden, siskin-like "zel"'. The bird skulked in a rusty barbed-wire dump, with body horizontal and head out. The absence of white streaks on wing-coverts and of barring on the flanks point to this species and against the possibility of the bird being a Baillon's Crake.

509. **WATER-RAIL.**—A bird was seen swimming across a dyke near Hornsea Mere on January 20th (G.H.A., J.L.). At Little Ouseburn on September 20th a dead bird on the road was picked up by A. Haigh-Lumby and sent to the Cartwright Museum, Bradford. H. R. Lowes saw a bird between Hatfield and Lindholme on September 30th. 'Each year one or two are flushed by my spaniel when shooting near Thirsk, it happened again in 1946' (B. Foggitt). 'Sharming' was heard at Newmillerdam, Wakefield, on October 27th and on December 28th (J.K.W.). Up to three occurred at Scarborough Mere from November 16th onwards (A.J.W.). A number of birds could be heard 'sharming' at Kelleythorpe at the end of November (J.H.B.).

510. **MOORHEN.**—A bird ringed as adult at York by Bootham School on November 14th, 1945, was at Ferrybridge on January 2nd, 1946 (Miss E. P. Leach in *British Birds*).

511. **COOT.**—Hornsea Mere, Swillington Ing, Fairburn Ing, Gowthwaite Reservoir are among the places where Coot congregate in winter. At Farnley Lake the 83 birds counted on January 15th had become reduced to about 25 by April 8th. In autumn about 60 seen on September 16th had increased by degrees to about 250 by December 30th (J.E.B.). At Hornsea Mere there were always large numbers in the winter months (G.H.A., J.L., J.R.W.). On December 21st Miss Crackles estimated the population at about 200 on the ice and some 600 on the bank. I have no records of ringed Yorkshire Coots, and direct evidence of the considerable movements that take place is very scanty. One bird was with gulls on a calm sea off Sandsend on January 27th (A.B.W.).

513. **BRITISH BLACK GROUSE.**—A blackcock and a greyhen frequented a part of the Mashamshire Moors for a month at the end of the year. The species is seldom seen at this end of Wensleydale (P. Young per R.C.).

520. **QUAIL.**—A bevy of four was seen in the Vale of Pickering on September 21st (J. T. Green).

### W. S. BISAT, F.R.S.

THE election of Mr. W. S. Bisat into the exclusive company of the Royal Society is a signal distinction for amateur geology in general and for Yorkshire geology in particular, because it is as a result of the high quality of his researches into the problems of the county that the award has been made.

Mr. Bisat's introduction to geology came from his training as a civil engineer and working in this capacity at Leighton reservoir he began his long and fruitful study of the fauna of the Carboniferous rocks. Dr. Wheelton Hind had then begun the investigation of the rocks now called Namurian. Mr. Bisat participated in this work and on the death of Dr. Hind he quickly became the leading authority on the morphology, classification and stratigraphical succession of the goniatites in these rocks. His results have provided the universally acknowledged basis for the correlation of the Namurian and he has in consequence gained an international reputation.

In more recent years he has directed his attention to the examination and detailed measurement of the well-known boulder clay cliffs of Holderness. This work, marked by the same keen observation and regard for detail which characterised his palaeontological studies, has given us a much more accurate picture of the succession of events in the Ice Age.

Mr. Bisat acted as President of the Yorkshire Naturalists' Union in 1935 and every member of the Union will wish to congratulate him on this well-deserved honour.

## THE FUNGUS FORAY AT SANDSEND

JOHN GRAINGER, JENNIE GRAINGER AND W. G. BRAMLEY

A JOINT foray of the British Mycological Society and the Union's Mycological Committee provided what is probably the largest and most intensive mycological gathering ever held in Yorkshire. The meeting extended from the 14th to the 20th of September and with headquarters at the Bungalow Hotel, Sandsend, excursions were made to Mulgrave Woods, to Egton Bridge for Arncliffe Woods and Glaisdale, to Grinkle Park and to Forge Valley. This foray was an auspicious occasion, since it is fifty years since the British Mycological Society was formed at a meeting of the Union's Mycological Committee at Selby.

The Annual Meeting of the Mycological Committee, the lectures and other transactions have been mentioned in the Union's Annual Report for 1946.

The I.M.I. party writes: 'Of the 67 pyrenomycetes found during the foray the following deserve special mention. *Chaetosphaeria cupulifera* is new to Yorkshire lists; it was found in association with a forest of conidiophores of *Catenularia cuneiformis* on oak wood. Berkeley and Broome in 1871 also found the two growths in association. Hysterothecia of *Farlowiella carmichaeliana* were again found in the characteristic habitat, in association with *Sporocybe flexuosa* although one collection on Beech showed no synnemata of the *Sporocybe*. *Rhamphoria tympanidispora*, the ascospores of which bud in the asci, was found on rotten wood of *Quercus*; this is another new record for Yorkshire.

Fungi found as usual in association with various species of Diatrypeaceae included *Chaetosphaeria phaeostroma* and *Ophionectria cerea*. Likewise, *Tympanopsis euomphala* was collected again growing with *Hypoxyylon rubiginosum* on Ash.

The following Hyphomycetes are of interest. The cut end of a log of oak meant for the fire in the workroom of "The Bungalow" bore *Gonatobotryum fuscum*, which is new to Yorkshire. It has been found three times in the country the first collection being made at Haslemere in 1945. *Helminthosporium turbinatum* was found growing in amazing profusion on dead branches of *Sambucus*; *Exosporium tiliae* (Link ex Wallr.) on twigs of Lime also gives distinction to a fine list of Hyphomycetes.

On dead wood was found a fungus which matches exactly the material on which was made the one and only British record of *Clasterosporium claviforme* var. *leptopus* Sacc. As the fungus is not a *Clasterosporium* and the original identification possibly at fault it is best not to include it in the Yorkshire list, although it is worth while drawing attention to it.

We wish to thank the following for lists of fungi found:—Messrs. E. W. Mason, S. J. Hughes, J. Webster, J. S. Hughes and A. Broadbent; Drs. W. P. K. Findlay, G. C. Ainsworth, Alex Smith and C. T. Ingold; Miss E. M. Wakefield, Dr. R. W. G. Dennis and Messrs. A. A. Pearson, F. A. Sowter and P. H. B. Talbot have rendered invaluable help in naming species.

- |   |                           |
|---|---------------------------|
| A. = Arncliffe Woods  | F. = Forge Valley.        |
| B. = Beggar's Bridge.   | M. = Mulgrave Woods.      |
| G. = Glaisdale  | S. = Sandsend.            |
| GR. = Grinkle   | SP. = Skelder Plantation. |
| M. & G. = Mason and Grainger, <i>Catalogue of Yorkshire Fungi</i> . |                           |
| * = Not included in M. & G..  |                           |
| † = Not included in M. & G. for V.C. 62.                            |                           |

### LIST OF FUNGI

#### MYXOMYCETES

- |   |   |
|---|---|
| <i>Arcyria denudata</i> Wettstein, M.F.A.     | <i>Lycogala epidendrum</i> Fr., F.        |
| <i>A. nutans</i> Grev., M.W.                  | * <i>Physarum conglomeratum</i> Rost., M. |
| <i>Ceratiomyxa fruticulosa</i> Macbride, M.F. | <i>P. nutans</i> Pers., M.F.A.            |
| <i>Diderma floriforme</i> Pers., M.F.         | <i>Reticularia lycoperdon</i> Bull., M.F. |
| <i>Didymium difforme</i> Duby, M.             | <i>Trichia affinis</i> de Bary, F.        |
| <i>Fuligo muscorum</i> Alb. and Schwein., SP. | <i>T. botrytis</i> Pers., M.A.            |
| <i>F. septica</i> Gmelin, M.                  | <i>T. varia</i> de Bary, M.A.             |
|   | <i>Tubifera ferruginosa</i> Gmel., M.F.   |



## PHYCOMYCETES

- † *Cystopus cubicus* (Strauss) de Bary, on *Tragopogon pratensis*, G.  
*Phytophthora infestans* (Mont.) de Bary, on *Solanum tuberosum*, F.  
*Pilobolus kleinii* van Tiegh., M.  
† *Plasmopara pusilla* (de Bary) Schroet., on *Geranium pratense*, G.  
*Plasmopara nivea* (Unger) Schroet. on *Angelica sylvestris*, M.  
*Peronospora ficariae* Tul., on *Ranunculus repens*, F.  
*Synchytrium taraxaci* de Bary et Woron., on *Taraxacum officinale*, F.  
*Syzygites megalocarpus* Ehrenberg ex Fr., on an agaric, M.

## ASCOMYCETES

## ERYSIPHALES

- Erysiphe cichoracearum* DC., on *Arctium vulgare*.  
*Erysiphe polygoni* DC., S. on *Heracleum*, M.

## EXOASCALES

- \* *Taphrina tosquineti* on *Alnus glutinosa*, G. (M. & G. sub *Exoascus alnitorquus*).  
*Protomyces pachydermus* Thuem., on *Taraxacum officinale*, F.

## DISCOMYCETALES

- \* *Ascobolus furfuraceus* Pers., M.  
*A. viridis* Currey, F.M.  
*A. vinosus* Berk., A.  
*Bulgaria inquinans* (Pers.) Fr., on *Quercus* M., GR.  
*Ciliaria scutellata* (Linn.) Quél., F.M.  
*C. umbrorum* (Fr.) Boud., F.  
*Chlorosplenium aeruginosum* (Oeder) de Not., M.F.  
*Colpoma quercinum* (Pers.) Wallr., on *Quercus*, M.  
*Coryne sarcoides* (Jacq.) Tul., M.A.  
\* *Corynella prasinula* (Karst.) Boud., on *Fagus* M.  
*Cudoniella acicularis* (Bull.) Schroet. F.  
*Cyathicula coronata* (Bull.) de Not., F.  
*Dasyscypha virginea* (Batsch) Fckl., M.A.  
*D. calycina* (Schum.) Fckl., M.  
† *Geoglossum glabrum* Pers., GR.  
*Helotium citrinum* (Hedw.) Fr., A.F.  
\* *H. pileatum* Karst., M.  
*H. fagineum* Fr., M.  
*H. scutula* Karst., on *Spiraea* M.  
*Helvella crispa* Fr., M.  
*H. elastica* Bull., M. (M. & G. sub *Leptopodia*)  
*H. lacunosa* Afz., M.  
*Humaria granulata* (Bull.) Quél., M.A. (M. & G. sub *Coprobria*).  
*H. rutilans* (Fr.) Quél., A.  
\* *Hymenoscypha firma* (Pers.), M.  
*Lachnea dalmeniensis* (Cooke) Phil., A.  
*L. albo-spadicea* Phil., F.  
*Lasiobolus equinus* Karst., M.  
*Leotia lubrica* (Scop.) Pers., M.S.G.R.  
*Mollisia cinerea* (Batsch) Fr., M.F.A.  
*Orbilia xanthostigma* Fr., M.  
*Otidea leporina* (Batsch) Fckl., M.  
*Peziza aurantia* Pers., A.  
*P. repanda* Wahl., F.  
\* *P. succosa* Berk., F.  
*P. vesiculosa* Bull., F.  
*Phialea firma* (Bull.) Quél., SP.  
*Polydesmia pruinosa* (Berk. & Br.) Boud., on *Hypoxylon multifforme* on *Betula*, SP.  
\* *Propolis versicolor* (Fr.) Fr., on *Fagus* M., *Quercus* F., *Rosa* SP.  
*Pseudopeziza trifolii* Fckl., A.  
*Rhytisma acerinum* (Pers.) Fr. ex Fr., on *Acer*, M.  
*Sclerotinia curreyana* Karst., A.  
*Stegia ilicis* Fr., M.  
*Tapesia caesia* (Pers.) Fckl., on *Quercus*, A.

## PYRENUMYCETALES

- Anthostoma turgidum* (Pers. ex Fr.) Nits., on *Fagus*, A. (M. & G. sub *Valsa*).  
*Berlesiella nigerrima* (Blox. ex Curr.) Sacc., on *Diatrype stigma* on *Acer*, F.  
*Betula* M.  
*Bertia moriformis* (Tode ex Fr.) Sacc., on wood M.  
\* *Botryosphaeria melanops* (Tul.) Wint., on *Quercus* M.  
*Chaetomium elatum* Kunze & Schmidt ex Fr., on *Heracleum* F.  
\* *Chaetosphaeria cupulifera* (Berk and Br.) Sacc., on wood of *Quercus* M. with *Catenularia cuneiformis* (Richon) Mason.  
\* *C. innumera* (Berk. and Br.) Tul., on *Quercus* M.F., wood M.  
*C. phaeostroma* (Dur. and Mont.) Fuckel, on *Hedera*, *Salix* M., *Acer* F., with *Diatrypaceous* fungus.



## PYRENOAMYCETALES—continued

- Chromocrea gelatinosa* (Tode ex Fr.) Seaver, on *Acer* M.  
*Claviceps purpurea* (Fr.) Tul., on *Deschampsia* F.A., *Holcus* A.G.  
 \**Coleroa chaetomium* (Kunze ex Fr.) Rabenh., on *Rubus* M.  
*Cordyceps militaris* (Linn. ex Fr.) Link, on insect SP.  
 \**Coronophora angustata* Fuckel, on *Fraxinus* M.  
*Cryptosphaeria eunomia* (Fr.) Fuckel, on *Fraxinus* M.  
*Cryptospora suffusa* (Fr.) Tul., on *Alnus* M.  
*Daldinia concentrica* (Bolton ex Fr.) Ces. and de Not., on *Alnus* M.  
*Dialonectria sanguinea* (Bolton ex Fr.) Cooke, on *Sambucus* M. on *Nitschkia tristis* and *Diatrype stigma* G.  
 \**Diaporthe arctii* (Lasch.) Nits., on *Arctium* M.  
 \**D. eres* Nits., on *Hedera* M.  
 †*Diatrype bullata* (Hoffm. ex Fr.) Fr., on *Salix* M.  
*D. disciformis* (Hoffm. ex Fr.) Fr., on *Fagus* M.A.  
*D. stigma* (Hoffm. ex Fr.) Fr., on *Salix*, *Betula*, M.  
 \**Diatrypella favacea* (Fr.) Ces. and de Not., on *Fagus* M.S., *Alnus*, M.  
*D. quercina* (Pers. ex Fr.) Cooke, on *Quercus* S.  
*Eutypella stellulata* (Fr.) Sacc., on *Ulmus* A.  
 \**E. sorbi* (Fr.) Sacc., G.  
 \**Farlowiella carmichaeliana* (Berk.) Sacc., on *Fagus* A., *Quercus* A.  
 †*Gibberella cyanogena* (Desm.) Sacc., on *Sambucus* M.  
 \**Gloniopsis levantica* Rehm., on *Rosa* S., *Crataegus*, *Rubus* M. *Rhododendron* F.  
*Hypocrea rufa* (Pers. ex Fr.) Fr., on *Betula* M.  
*H. pulvinata* Fuckel, on *Polyporus betulinus* A.  
*Hypoxydon fuscum* (Pers. ex Fr.) Fr., on *Alnus* F.  
*H. multiforme* (Fr.) Fr., on *Betula* A.M.SP., on *Corylus*, G.  
*H. rubiginosum* (Pers. ex Fr.) Fr., on *Fraxinus* M., *Ulmus* M.  
*H. semi-immersum* Nits., on wood M., *Quercus*, *Fagus* M.  
*H. serpens* (Pers. ex Fr.) Fr., on *Acer* M., *Betula* SP., *Fagus* M., *Quercus* A., wood M.  
*Hysterium pulicare* Pers. ex Fr., on *Hedera* M.  
 \**H. angustatum* (Alb. and Schw. ex Fr.) Chev., on *Cornus* M., *Rhododendron* F.  
*Lasiosphaeria hirsuta* (Fr.) Ces. and de Not., on *Fraxinus* M., *Fagus* M., *Ulmus* A., *Quercus* A.  
 \**L. ovina*, (Pers. ex Fr.) Ces and de Not., on wood F.  
 \**L. spermoides* (Hoffm. ex Fr.) Ces. and de Not., on *Fraxinus* M.A.  
 \**L. strigosa* (Alb. and Schw. ex Fr.) Sacc., on wood M.  
*Leptosphaeria doliolum* (Pers. ex Fr.) de Not., on *Urtica* M.  
 \**L. rusci* (Wallr.) Sacc., on *Ruscus* M.  
*Melanconis alni* Tul., on *Alnus* M.  
*M. stilbostoma* (Fr.) Tul., on *Betula* M.  
 \**Melanomma fuscicululum* Sacc., on *Sambucus* M.  
*M. pulvis-pyrius* (Pers. ex Fr.) Fuckel, on wood M., *Ulmus* A., *Betula* A.  
*Nectria inventa* Pethybridge (Conidial [= *Acrostalagmus cinnabarinus*]) on *Sambucus* M.  
*N. cinnabarina* (Tode ex Fr.) Fr., on *Alnus* M.  
 †*N. punicea* (Kunze and Schm. ex Fr.) Fr., on *Alnus*, *Fagus*, *Quercus*, *Ulmus* M.  
*N. sinopica* (Fr.) Fr., on *Hedera* M.  
 \**Nummularia lutea* (Alb. and Schw. ex Fr.) Nits., on *Corylus* M.  
 \**Ophiobolus rubellus* (Pers. ex Fr.) Sacc., on *Heracleum* M.  
 \**Ophionectria cerea* (Berk. and Curt) Ell. and Ev., on *Fagus* A., associated with a *Diatrypaceous* fungus.  
 \**Peroneutypa heteracantha* (Sacc.) Berl., on *Acer*, *Tilia* F.  
*Quaternaria quaternata* (Pers. ex Fr.) Schroet., on *Fagus* M.A.  
 †*Q. dissepta* (Fr.) Tul., on *Ulmus* M.  
 \**Rhamphoria tympanidispora* Rehm, on *Quercus* M.  
*Rhopoglyphus filicinus* (Fr.) Fuckel, on *Pteridium* SP.  
*Rosellinia thelena* (Fr.) Rabenh., on *Fagus* A.  
 †*R. velutina* Fuckel, on wood M.  
*Stigmatea robertiana* Fr., on *Geranium Robertianum* F.  
 \**Tympanopsis euomphala* (Berk. and Curt.) Starb., on *Fraxinus* M.  
*Valsa ambiens* (Pers. ex Fr.) Fr., on *Prunus* M., *Fagus* M.  
 \**V. cureyi* Nits., on *Larix* M.  
*Xylaria hypoxydon* (Linn.) Fr., GR.F.  
*X. longipes* Nits., on *Acer* A.  
*X. polymorpha* (Pers. ex Fr.) Grev., on wood A.  
*X. carpophila* (Pers. ex Fr.) Fr., on Beech mast, M.

## BASIDIOMYCETES

## USTILAGINALES

- Ustilago violacea* (Pers.) Tul., on *Melandrium album* M., *M. dioicum* S.  
† *Entyloma microsporum* (Unger) Schroet., on *Ranunculus repens* F.      \**Tilletia holci* on *Holcus lanatus* G.

## UREDINALES

- Uromyces fabae* (Pers.) de Bary, S. II on field beans.  
*U. geranii* Otth. and Wart., on *Geranium pratense* G.S, II, III.  
*U. dactylidis* Otth., S, III.  
*Uromyces valerianae* (Schum.) Fuckel, on *Valeriana officinalis*, G.F  
*Puccinia angelicae* Fuckel, on *Angelica sylvestris* M.  
*P. anomala* Rost., S, II, III, on Barley.  
† *P. antirrhini* on *Antirrhinum majus* G.  
*P. annularis* Schl., on *Teucrium scorodonia* G, III.  
*P. baryi* Wint., on *Brachypodium sylvaticum* G, II.  
† *P. bromina* Erikss., on *Bromus giganteus* M, II.  
*P. caricis* (Schum.) Reb., on *Carex pendula*, F.S, II, III.  
† *P. chaerophylli* Purt., on *Myrrhis*, A, G, II, III.  
† *P. cirsii* Lasch., on *Cirsium palustre* G.S, II, III.  
† *P. celakovskiana* Bub., on *Galium cruciata* G.  
*P. glechomatis* DC., on *Nepeta glechoma* G.S, III.  
*P. glumarum* E. and H., on *Bromus* sp. M.  
† *P. holcina* Erikss., G, II, III,  
*P. hieracii* Mart., on *Hieracium murorum*, G, III.  
*P. lapsanae* Fuckel, on *Lapsana communis* M.S, II, III.  
*P. lolii* Niels., on *Lolium perenne*, S, II, III.  
*P. lychnidearum* Link, on *Melandrium dioicum* F.M.S, III.  
*P. malvacearum* Mont., on *Malva sylvestris* S, III.  
*P. menthae* Pers., on *Mentha aquatica* S, II, III.  
*P. obscura* Schroet., on *Luzula sylvatica* F.  
*P. obtegens* Tul., on *Cirsium arvense* G.  
*Puccinia poarum* Niels., on *Tussilago farfara* G.F.S, OI.  
*P. primulae* Duby, on *Primula vulgaris* M.  
*P. saniculae* Grev., on *Sanicula europaea* M.F.  
*P. sonchi* Rob., on *Sonchus oleraceus* S, II, III.  
*P. smyrnii* Corda, on *Smyrniolum olusatrum* S, OI.  
*P. taraxaci* Plowr., on *Taraxacum officinale* G.  
*P. valantiae* Pers., on *Galium saxatile* G, III.  
*P. veronicae* Schroet., on *Veronica montana* F.  
*P. violae* (Schum.) DC., on *Viola* sp. F.  
*Phragmidium mucronatum* Fr., on *Rosa canina* F.M.  
*P. violaceum* Wint., on *Rubus fruticosus* F.G.S, II, III.  
\**Kuehneola uredinis* Arth., on *Rubus fruticosus* F.  
† *Coleosporium tussilaginis* Tul., on *Tussilago farfara* F.S, II, III.  
*C. Sonchi* Lév., on *Sonchus oleraceus* F.  
† *C. Petasitis* Lév., on *Petasites vulgaris* F.S, II, III.  
*Melampspora* sp., on *Salix Caprea* G. and M.  
*M. lini* Desm., on *Linum catharticum* G.  
*Melampsporidium betulinum* (Pers.) Kleb., on *Betula pendula* G.SP, II, III.  
*Pucciniastrum agrimoniae* (Schw.) Tranz., on *Agrimonia eupatoria* G.  
*P. circaeae* (Schum.) Speg., on *Circaea lutetiana* G.M.  
† *P. pustulatum* Diet., on *Epilobium angustifolium* G.  
*Thecopsora vacciniorum* (DC.) Lagerh., on *Vaccinium myrtillus*, G.S.SP., II.

## AGARICALES

- Amanita mappa* (Batsch) Fr., A.  
*A. muscaria* (L.) Fr., A.S.M.  
*A. phalloides* (Vaill.) Fr., A.S.M.  
*A. rubescens* (Pers.) Fr., A.S.M.  
*A. spissa* Fr., A.S.F.  
*Amanitopsis fulva* (Schaeff.) W. G. Sm., S.M.  
*Amanitopsis strangulata* (Fr.) Roze, S.M.  
*A. vaginata* (Bull.) Roze, M.  
*Lepiota amianthina* (Scop.) Fr., A.S.M.  
*L. acutesquamosa* (Weinm.) Fr., A.  
† *L. castanea* Quel., M.  
*L. cristata* (A. et S.) Fr., A.  
*L. procera* (Scop.) Fr., M.

## AGARICALES—continued

- Lepiota rhacodes* (Vitt.) Fr., A.M.  
*L. sistrata* Fr., F.  
*Armillaria mellea* (Vahl.) Fr., A.S.M.  
*A. mucida* (Schrad.) Fr., S.  
*Tricholoma acerbum* (Bull.) Fr., M.  
*T. albobrunneum* (Pers.) Fr., A.M.  
*T. argyraceum* (Bull.) Fr. (= *T. scalpturatum*), M.F.  
*T. atosquamosum* Chev., S.  
*T. fulvum* (DC.) Fr., M.  
*T. personatum* Fr., A.M.  
*T. rutilans* (Schaeff.) Fr., A.S.  
*T. terreum* (Schaeff.) Fr., A.S.M.  
*T. ustale* Fr., A.  
*Russula adusta* (Pers.) Fr., A.M.  
*R. caerulea* Cke., S.  
*R. cyanoxantha* (Schaeff.) Fr., A.M.S.  
*R. delicata* Fr., A.  
*R. drimeia* Cke., M.S.  
*R. emetica* (Schaeff.) Fr., A.M.  
*R. fallax* (Schaeff.) Massee, S.M.  
\* *R. farinipes* Romell, M.  
*R. fellea* Fr., A.M.S.  
*R. foetens* (Pers.) Fr., A.M.S.  
*R. fragilis* (Pers.) Fr., A.M.S.  
† *R. graminicolor* (Secr.) Bres., S.M.  
*R. grisea* (Pers.) Bres., M.  
*R. heterophylla* Fr., M.  
*R. lepidota* Fr., S.  
*R. luteo-tacta* Rea, M.  
*R. maculata* Quél., F., S.  
*R. nigricans* (Bull.) Fr., S.M.  
*R. ochroleuca* (Pers.) Fr., A.S.M.  
*R. pectinata* (Bull.) Fr., M.  
*R. puellaris* Fr., A.S.  
† *R. punctata* (Gill.) Maire, S.  
*R. rosacea* (Pers.) Fr., A.  
*R. rosea* Quél., A.  
\* *R. venosa* Melzer (= *R. sphagnicola*) S.M.  
*R. vesca* Fr., A.S.  
*R. xerampelina* (Schaeff.) Fr., M.  
*Mycena ammoniacia* Fr., A., S., M.  
*M. capillaris* (Schum.) Fr., A., S.  
*M. epipterygia* (Scop.) Fr., A.  
*M. filopes* (Bull.) Fr., M.  
*M. galericulata* (Scop.) Fr., A.S.M.  
*M. galopus* (Pers.) Fr., A.S.  
*M. hiemalis* (Osbeck) Fr., A.  
*M. inclinata* Fr., A.M.  
*M. metata* Fr., F.  
*M. polygramma* (Bull.) Fr., F.S.  
*M. pura* (Pers.) Fr., A.S.  
*M. rugosa* Fr., A.  
*M. rubro-marginata* Fr., S.  
*M. stylobates* (Pers.) Fr., F.  
*M. tenerrima* Berk., F.  
† *Collybia ambusta* Fr., S.  
*C. butyracea* (Fr.) Bull., M.S.  
*C. fusipes* (Bull.) Berk., F.  
*C. maculata* (A. et S.) Fr., A.  
*C. platyphylla* (Pers.) Fr., S.  
*Collybia radicata* (Relh.) Berk., M.  
*C. velutipes* (Curt.) Fr., S.  
*Marasmius caticinalis* (With.) Fr., M.  
*M. dryophilus* (Bull.) Karst., M.  
*M. erythropus* (Pers.) Fr., GR.  
*M. esculentus* (Wulf.) Karst., M.  
*M. hariolorum* (DC.) Quél., A., M.  
*M. oreades* (Bolt.) Fr., M.  
*M. peronatus* (Bolt.) Fr., A.M.GR.  
*M. ramealis* (Bull.) Fr., F.  
*M. wynniae* B. et Br., F. (M. and G. sub *M. globularis* Fr.)  
*Androsaceus androsaceus* (Linn.) Pat., A.M.  
*Lactarius aurantiacus* (Fl. Dan.) Fr., M.  
*L. blennius* Fr., M.GR.  
*L. camphoratus* (Bull.) Fr., A.  
*L. chrysorheus* Fr., A.  
*L. cyathula* Fr., F.  
*L. deliciosus* (Linn.) Fr., F.  
*L. glyciosmus* Fr., A.S.M.  
*L. lignytus* Fr., S.M.  
*L. mitissimus* Fr., M.GR.  
*L. pallidus* (Pers.) Fr., A.  
*L. pubescens* Fr., M.GR.  
*L. pyrogalus* (Bull.) Fr., F.A.M.GR.  
*L. quietus* Fr., S.M.GR.  
*L. rufus* (Scop.) Fr., S.M.GR.  
*L. seriffuus* (DC.) Fr., A.GR.  
*L. subdulcis* (Pers.) Fr., A.M.GR.  
*L. torminosus* (Schaeff.) Fr., M.  
*L. turpis* (Weinm.) Fr., F.S.M.GR. (= *L. plumbeus* [Nat., Jan.-March, 1947, p. 3]).  
*L. uvidus* Fr., A.GR.  
*L. vellereus* Fr., A.M.GR.  
*L. vietus* Fr., A.S.M.  
*Hygrophorus calyptraeformis* Berk., M. A.  
*H. ceraceus* (Wulf.) Fr., A.M.  
*H. coccineus* (Schaeff.) Fr., A.S.GR.  
*H. chlorophanus* Fr., A.M.GR.  
*H. eburneus* (Bull.) Fr., M.GR.F.  
*H. laetus* (Pers.) Fr., A.S.  
*H. miniatus* Fr., F.  
*H. nigrescens* Quél., A.M.  
*H. pratensis* (Pers.) Fr., A.M.GR.  
*H. psittacinus* (Schaeff.) Fr., M.GR.  
*H. puniceus* Fr., GR.  
*H. unguinosus* Fr., A.GR.  
*H. virgineus* (Wulf.) Fr., A.M.GR.  
*Clitocybe clavipes* (Pers.) Fr., A.S.M.  
*C. cyathiformis* (Bull.) Fr., A.  
*C. geotropa* (Bull.) Fr., M.  
*C. vibicina* Fr., sec. Quél., M. (in M. and G. as *C. expallens*)  
*Laccaria laccata* (Scop.) B. et Br., A. M.GR., also var. *amethystina* (Vaill.) B. et Br., A.M.  
*Omphalia grisea* Fr., M.F.  
*O. umbellifera* (Linn.) Fr., GR.



## AGARICALES—continued

- Pleurotus applicatus* (Batsch) Berk., M.  
*P. dryinus* (Pers.) Fr., M.  
*P. lignatilis* Fr., M.  
*Panus stipticus* (Bull.) Fr. A.  
*Pluteus salicinus* (Pers.) Fr., A.M.  
*Entoloma nidorosum* Fr., A. M.F.  
*E. porphyrophaeum* Fr., M.  
*Nolanea papillata* Bres., M.F.  
*N. stauospora* Bres., M. (M. and G., sub *N. proletaria*).  
*Leptonia lampropus* Fr., S.  
*L. sericella* (Fr.) Quel., M.  
*L. serrulata* (Pers.) Fr., A.  
*Clitopilus prunulus* (Scop.) Fr., M.F.  
*Pholiota erebia* Fr., GR.  
*P. mutabilis* (Schaeff.) Fr., A.  
*P. spectabilis* Fr., A.G.R.  
*P. squarrosa* (Mull.) Fr., A.M.  
*P. togularis* (Bull.) Fr., F.  
*Bolbitius titubans* (Bull.) Fr., A.  
*Inocybe corydalina* Quel., M.F.  
*I. geophylla* (Sow.) Fr., M.G.R., var. *lilacina* Fr., M.  
*I. godeyi* Gillet, A.  
*I. obscura* (Pers.) Fr., M.F.  
*Hebeloma crustuliniforme* (Bull.) Fr., A.M.F.  
*H. mesophaeum* Fr., M.  
*Naucoria cucumis* (Pers.) Fr., M.  
*Galera hypnorum* (Schrank) Fr., A.G.R.  
† *G. mycenopsis* Fr., A.  
*Tubaria furfuracea* (Pers.) W. G. Sm., A.  
*Flammula ochrochlora* Fr., GR.  
*F. sapinea* Fr., A.S.  
*Cortinarius* (Phleg.) *decolorans* (Pers.) Fr., M.  
*C. fulgens* (A. et S.) Fr., GR.  
*C. (Myx.) collinitus* (Sow.) Fr., A.F.  
*C. elatior* Fr., A.S.  
*C. mucosus* (Bull.) Fr., GR.  
*C. (Ino.) alboviolaceus* (Pers.) Fr., M.  
*C. bolaris* (Pers.) Fr., A.  
*C. violaceus* (Linn.) Fr., A.  
*C. (Dermo.) anomalus* Fr., F.  
*C. cinnamomeus* (Linn.) Fr., M.  
*C. ochroleucus* (Schaeff.) Fr., M.  
*C. semisanguineus* (Brig.) Maire, F.  
*C. uliginosus* Berk., A.  
*C. (Tela.) armillatus* Fr., M.  
*C. glandicolor* Fr., M.  
*C. hemitrichus* Fr., GR.  
† *Cortinarius helvelloides* Fr., F.  
*C. hinnuleus* (Sow.) Fr., M.  
*C. paleaceus* (Weinn.) Fr., S.M.  
*C. rigidus* (Scop.) Fr., M.  
*C. torvus* Fr., M.  
*Cortinarius (Hydro.) leucopus* (Bull.) Fr., A., GR.  
*C. scandens* Fr., M.  
*Crepidotus mollis* (Schaeff.) Fr., F. G.R.M.  
*Psalliota arvensis* (Schaeff.) Fr., M.  
*P. augusta* Fr., M.G.R.  
*P. sanguinaria* F., M.  
*P. sylvicola* (Vitt.) Fr., M.  
*P. xanthoderma* Genev., M.  
*Stropharia aeruginosa* (Curt.) Fr., A. M.G.R.  
*S. coronilla* (Bull.) Fr., M.  
*S. semiglobata* (Batsch) Fr., A.M.G.R.  
*Anellaria separata* (Linn.) Karst., A.  
*Hypholoma dispersum* Fr., A.  
*H. fasciculare* (Huds.) Fr., A., M., GR.  
*H. hydrophilum* (Bull.) Fr., A.M.  
*H. sublateralitium* (Schaeff.) Fr., A.M.  
*H. velutinum* (Pers.) Fr., F.  
*Psathyrella disseminata* (Pers.) Fr., M.  
*P. gracilis* Fr., GR.  
*Psathyra pennata* Fr., A.  
*Psilocybe bullacea* (Bull.) Fr., GR.  
*P. coprophila* (Bull.) Fr., M.  
*P. semilanceata* Fr., M.  
*Coprinus atramentarius* (Bull.) Fr., GR.  
*C. cinereus* (Schaeff.) Cke., M.  
*C. fuscescens* (Schaeff.) Fr., M.  
*C. micaceus* (Bull.) Fr., M.G.R.  
*C. plicatilis* (Curt.) Fr., M.G.R.  
*Cantharellus cibarius* Fr., A.G.R.M.  
*Craterellus cornucopioides* (Linn.) Fr., A.M.  
*Paxillus atrotomentosus* (Batsch) Fr., A.  
*P. involutus* (Batsch) Fr., S., GR.  
*Tylopilus felleus* (Bull.) Karst., A., M.  
*Boletus albidus* (Roques) Quel., M.  
*B. badius* Fr., GR.  
*B. chrysenteron* (Bull.) Fr., A.S.M.F.  
*B. edulis* (Bull.) Fr., A.M.  
*B. elegans* (Schum.) Fr., A.M.  
*B. erythropus* (Pers.) Quel., M.  
*B. piperatus* (Bull.) Fr., F.M.  
*B. scaber* (Bull.) Fr., F.M.  
*B. subtomentosus* (Linn.) Fr., A.M.

## APHYLLOPHORALES

- Polyporus adiposus* B. et Br., M.  
*P. adustus* (Willd.) Fr., A.G.R.  
*P. betulinus* (Bull.) Fr., A.M.  
*P. caesius* (Schr.) Fr., A.  
*P. frondosus* (Fl. Dan.) Fr., M.  
*P. giganteus* (Pers.) Fr.  
*P. picipes* Fr., GR.  
*Polyporus radiatus* (Sow.) Fr., A.S.  
*Fomes annosus* Fr., A.  
*F. connatus* Fr., A.  
*Ganoderma applanatum* (Pers.) Pat., M.  
*Poria sanguinolenta* (A. et S.) Fr., GR.  
*Polystictus abietinus* (Dicks.) Fr., GR.



## APHYLLOPHORALES—continued

- Polystictus versicolor* (Linn.) Fr., S.M. GR.  
*Irpex obliquus* (Schröd.) Fr., F.M.  
*Trametes mollis* (Sommerf.) Fr., M.  
*T. rubescens* (A. et S.) Fr., M.  
*Merulius corium* (Pers.) Fr., A.  
*Coniophora puteana* (Schum.) Karst., M.A.  
*Fistulina hepatica* (Huds.) Fr., A.G.R.  
*Hydnum repandum* (Linn.) Fr., A.  
*Grandinia brinkmanni* (Bres.) Bourd. et Galz., M.  
*G. granulosa* Fr., M.  
†*G. mutabilis* (Pers.) Bourd. et Galz., M.  
*Phylacteria terrestris* (Ehrenb.) Big. et Guill., M.  
\**P. spiculosa* (Fr.) Bourd. et Maise., M.  
*Tomentella ferruginea* Pers., M. (M. and G. sub *Hypochnus*).  
†*Hypochnella violacea* (Awd.) Schroet., M.  
*Stereum hirsutum* (Willd.) Fr., A.M. GR.  
*Stereum purpureum* (Pers.) Fr., M.  
*S. rugosum* (Pers.) Fr., M.  
*S. sanguinolentum* (A. et S.) Fr., GR.  
*S. spadiceum* Fr., GR.  
*Hymenochaete rubiginosa* (Dicks.) Lév., M.  
*Corticium sambuci* Pers. ex Fr., M.  
*Peniophora gigantea* (Fr.) Mass., A.  
*P. velutina* (DC.) Cooke, M.  
*Cyphella capula* (Holmsk.) Fr., M.  
*C. villosa* (Pers.) Karst., on *Heracleum* stems M.  
*Solenia anomala* (Pers.) Fr., on *Fagus*, M.A., *Alnus* M.  
*Clavaria cinerea* (Bull.) Fr., M.G.R.  
*C. cristata* (Holmsk.) Fr., M.  
*C. fumosa* (Pers.) Fr., GR.  
*C. luteo-alba* Rea, GR.  
*C. rugosa* (Bull.) Fr., S.M.G.R.  
*C. stricta* (Pers.) Fr., M.  
*C. vermicularis* Fr., M.  
*Typhula erythropus* (Bolt.) Fr., F.

## AURICULARIALES

- Auricularia auricula-judae* (Linn.) Schroet., on elder and black currant, M.A.

## TREMELLALES

- Tremella frondosa* Fr., M.  
*Exidia glandulosa* (Bull.) Fr., M.  
*Exidia nucleata* (Schwein.) Rea, A.

## CALOCERALES

- Dacryomyces deliquescens* (Bull.) Duby, A.G.R.  
*Calocera viscosa* (Pers.) Fr., A.G.R.

## GASTEROMYCETALES

- Cynophallus caninus* (Huds.) Fr., A. M.  
*Phallus impudicus* (Linn.) Pers., A. M., GR.  
*Lycoperdon depressum* Bon., M.  
*L. giganteum* (Batsch) Pers., M.  
*L. perlatum* Pers., A.M.G.R.  
*Lycoperdon pusillum* (Batsch) Pers., GR.  
*L. pyriforme* (Schaeff.) Pers., A.M.  
*L. umbrinum* Pers., M.  
*Bovista plumbea* Fr., GR.  
*Geaster rufescens* Pers., M.  
*Scleroderma aurantium* Pers., A.M.

## HYPHOMYCETES

- \**Acrothecium simplex* Berk. and Br., on stems of *Urtica*, M.  
\*†*Alatospora acuminata* Ing., B.M.  
*Arthrobotryum atrum* Berk. and Br., on stems of *Spiraea* M.F.  
*A. stilboideum* Ces., on wood of *Quercus*, M.  
\*†*Articulospora tetraccladia* Ing., A.B.  
†*Aspergillus fumigatus* Fres., M.  
*Bispora monilioides* Corda, on wood of *Corylus* and *Fagus*, A.  
*Botrytis* sp., on petioles of *Petasites* and stems of *Heracleum*. F. (M. and G., incorrectly as *Pachybasium tilletii*).  
†*Brachysporium apicale* (Berk. and Br.) Sacc., on wood of *Ulmus*, A.  
*B. obovatum* (Berk.) Sacc., on wood of *Fagus*, A.  
\**Catenularia cuneiformis* (Richon) Mason, on wood, M.A., and wood of *Quercus*, M.  
*Cercospora mercurialis* Pass., on leaves of *Mercurialis*, M.  
†*Clasterosporium abruptum* Berk. and Br.) Sacc., on wood of *Acer*, F.  
\**C. fasciculare* (Corda) Sacc., on wood of *Quercus*, A.

## HYPHOMYCETES—continued

- \*† *Claviariopsis aquatica* De Wild, B.F.M.  
 † *Dendryphium curtum* Berk. and Br.,  
 on wood of *Sambucus*, M.  
 \* *Diplococcium spicatum* Grove, on  
 wood of *Quercus*, A.  
 \* *Exosporium tiliae* (Link ex Wallr.)  
 Fr., on twigs of *Tilia*, F.  
 \*† *Flagellospora curvula* Ing., A.B.F.M.,  
*Fusidium viride* Grove, on stems of  
*Heracleum*, *Urtica*, M., petioles of  
*Petasites*, M.F., leaves of *Urtica*, M.  
 \* *Gonatobotryum fuscum* Sacc., on logs  
 of *Quercus* (fire-wood, 'The  
 Bungalow,' Sandsend).  
 † *Gonytrichum caesium* Nees ex Wallr.,  
 on wood of *Sambucus*, Bamboo, M.,  
*Ulex*, SP, on wood, SP.  
 † *Haplaria grisea* Link ex Chev., on  
 wood of *Quercus*, M.  
 \*† *Heliscus longibrachiatus* Ing., B.  
 \* *Helminthosporium fusisporium* Berk.,  
 on wood of *Acer*, F., Bamboo,  
*Betula*, *Fagus*, M.  
 \* *H. turbinatum* Berk. and Br., on wood  
 of *Sambucus*, M.  
*H. velutinum* Link ex Fr., on wood of  
*Corylus*, *Tilia*, F., *Acer*, *Hedera*, M.  
 \*† *Lemonniera aquatica* De Wild, A.B.  
 F.M.  
 \*† *Lunulospora curvula* Ing., F.M.  
 \* *Mastigosporium rubricosum* Sprague,  
 A.F.M.  
*Menispora ciliata* Corda, on wood, M.  
 F., on wood of *Betula*, F.M. *Fagus*,  
 M., *Quercus*, A.  
 \* *Menispora tortuosa* Corda, on inside of  
 bark of *Fagus*, M.  
*Monilia aurea* Gmel., on wood of  
*Fraxinus*, M., *Betula*, M.  
*Nematogonium aurantiacum* Desm., on  
 bark of *Ulmus*, A.  
 \* *Pachnocybe clavulata* Grove, on wood  
 of *Sambucus*, F., on wood, M.  
*P. grisea* Berk., on stem of *Heracleum*,  
 M. (M. and G. sub *Graphium*).  
 \* *Pachybasium hamatum* (Bon.) Sacc.,  
 on a bird's nest, M.  
 \* *Papularia arundinis* (Corda) Fr., on  
 stems of Bamboo, M.  
 † *Periconia byssoides* Pers. ex Corda, on  
 stems of *Heracleum*, *Urtica*, M., on  
 petioles of *Petasites*, M.F.  
*Rhinotrichum niveum* Cooke and  
 Massee, on *Fagus*, A.  
*Sporocybe flexuosa* (Mass.) Mason, on  
 wood, S., wood of *Acer*, F., *Quercus*,  
 A. (M. and G. sub *Graphium*).  
 † *Sporoschisma mirabile* Berk. and Br.,  
 on Bamboo, M.  
 † *Stachybotrys dichroa* Grove, on petioles  
 of *Petasites*, F.  
 \* *Stachylidium bicolor* Link, on stems  
 of *Heracleum*, M.F., Nettle, M., and  
 rachis of *Pteris*, F.  
*Stachylidium cyclosporum* Grove, on  
 wood of *Quercus*, *Betula*, M.  
 \* *Stysanus microsporus* Sacc., on wood  
 of *Sambucus*, M.  
 \*† *Tetrachaetum elegans* Ing., A.B.F.  
 \*† *Tetracladium marchalianum* DeWild,  
 A.B.F.M.  
*Torula herbarum* Link ex Fr., on wood  
 of *Sambucus*, M., *Alnus*, on stems  
 of *Heracleum*, M.  
 \* *T. hysterioides* Corda, on wood, A.  
 \* *Verticicladium apicale* (Berk. and Br.)  
 Sacc., on wood, A.

‡ Water moulds collected and named by Professor C. T. Ingold.

## BOOK REVIEWS

**Bird Life in Two Deltas**, by G. K. Yeates pp. 159, with 48 pages of photographs; Faber and Faber, Ltd., 15/-. The diaries of visits before 1939 to the estuaries of the Guadalquivir and the Rhone (twice) provide the author with material for an excellent book which would no doubt, but for the recent war, have made an earlier appearance. We laugh at the racily narrated experiences, admire the careful ornithological work and the photographs, and are interested throughout. The book is eminently readable and has both temporary and permanent value. The previous literature on those famous bird resorts—Spanish Marismas and Ile de la Camargue—is listed in a bibliography and was evidently familiar to Capt. Yeates before he made his journeys. Future ornithological visitors to either of these regions will be wise to consult Yeates. Passage migrants, in April and May, were seen in numbers, most of them of interest to Englishmen; whilst many of the Andalusian and Provençal species were already breeding. Illustrated by the author's well-known command of sound photographic technique, the birds depicted, often superbly, include Buff-backed and Night Herons, Little Egret, Griffon Vulture, Kentish Plover, Black-winged Stilt, Hoopoe, Penduline Tit, and Fantail, Sub-Alpine and Spectacled Warblers. Any naturalist should be interested by this fine book by a recently elected member of the Y.N.U.—R. C.

**Nature and my Cine-Camera**, by **Oliver G. Pike**, pp. 240, including 68 pp. of illustrations; Focal Press, Ltd., 15/-. This book is written and published primarily for cinematographers, and to those who are beginning that pursuit and also to more advanced workers, it should be very useful. They are introduced to a variety of subjects suitable for their cameras, mammals and birds (wild and captive), insects and even microscopical life, and are told how their cameras may be advantageously used for such subjects. Apparatus is discussed; well conceived and executed diagrams illustrate the purposes of lenses of differing focal lengths, amplified by descriptive matter and illustrated again by excerpts from some of the author's films and by still photographs. The desire to increase the number of illustrations on one page seems to have been overdone, even to the extent of mutilation of creatures depicted.

Naturally, being the possessor of, probably, the longest memory among living wild-life photographers, Mr. Pike recalls pleasantly many of his earlier experiences with bird and beast, not all of which have been narrated in his previous books. The illustrations include some with which we are familiar and others we have not seen before. The author admits to still photographs taken back in his boyhood days in the early 'nineties' and to cinematography begun in 1905. The extensive experience gained in that long period is here available for any who are likely to be interested.—R. C.

**Masterpieces of Bird Photography**, edited by **Eric Hosking** and **Harold Lowes**, pp. 144, with 66 illustrations; Collins, 12/6. This volume will fill a very real gap in the literature of Natural History photography and its advent will be welcomed by all naturalists and particularly bird-photographers and would-be bird-photographers. The editors and all others concerned are to be congratulated on the assembly of such a gallery of pictures by 52 masters of the craft, past and present. The arrangement of the book is excellent. Pride of place is rightly given to the Kearnton brothers, who led the way, turning out excellent photographic records in the 90's of the last century, and providing the inspiration for some of the best work of their many disciples. The remaining 50 workers are arranged in alphabetical order. The 60 photographs have been carefully chosen and they cover bird-photography in all its aspects. While the great importance of records of birds at the nest has been recognised, the editors have wisely included many examples of work done under other conditions. Outstanding examples of these latter are John Barlee's Kittiwake in flight, Guy Farrar's group of Curlew, bartailed Godwit, Oyster Catcher and Knot, and J. A. Speed's Swallow in flight.

It is very useful to have the fairly detailed biographical notices of the photographers and this unique book would have been very much the poorer without Ralph Chislett's historical outline of bird photography. Here at last one can read of the rise and development of one of the most flourishing branches of nature study, from the modest beginnings in 1892, followed by the foundation of the Zoological Photographic Club in 1899, and on through the years until 1947, when the editors of this volume must have been seriously embarrassed in their efforts to choose five dozen prints from the hundreds of thousands now available.

**Speed in Animals—their specialisation for running and leaping**, by **A. Brazier Howell**. University of Chicago Press, Chicago, and Cambridge University Press, London, 24/-, xii + 270 pp., 1944. The title of this book is unfortunate since it is essentially concerned with the description and analysis of speed in mammals which the author admits is his main interest. The progression of invertebrates is not considered whilst the movements of the lower vertebrates have little more than a passing reference, and there is no mention of Gray's work on the locomotion of fishes and other animals. A more complete discussion of the evolution of the pentadactyl limb and its mechanical potentialities in relation to its adaptations would have provided a more appreciative approach to the mass of anatomical detail concerning the muscles, axial skeleton, limbs and limb girdles, proportions and gaits, presented in explanation of the mechanism of the processes involved in the varying modes of running and leaping. The amount of information is at times either overwhelming or too condensed whilst technical terms are introduced too frequently without explanation. On the other hand parts are written with great clarity as for example the account of various gaits of the horse, and there are many helpful illustrations. In spite of the fascination of the subject,



and the extent to which the author does succeed in bringing vitality to form the book will have a limited appeal and is for those with expert knowledge rather than general readers.

**Practical Field Ecology** by R. C. McLean and W. R. I. Cook, pp. 207, with 50 diagrams and text figures; Allen and Unwin, Ltd., 9/-. **Plant Ecology and the School**, by A. G. Tansley and E. Price Evans, pp. 97, with 10 figures; Allen and Unwin, Ltd., 6/-. Students of ecology in this country now have available for reference a wide choice of descriptive texts ranging from the elementary to Prof. Tansley's comprehensive account of *The British Isles and their Vegetation*. They have hitherto been much less well provided for with books dealing with practical methods, and Prof. McLean and Dr. Cook's book, which is based on many years of experience in conducting field classes, should be assured of a well-deserved welcome by all students and post-graduate workers in field ecology. It deals fully with methods of surveying and mapping, with the quantitative and sociological analysis of vegetation and with the estimation of soil, climatic and physiological factors. Special chapters are devoted to methods of study of the ecology of ponds and streams and of the seashore, and full directions are given throughout as to the most convenient apparatus and equipment required for all phases of the work. Its utility in the field will be increased by the inclusion of three appendices giving keys for the identification of grasses by vegetative characters, of the chief British marine algae, and of the common genera of the higher Basidiomycetes.

Prof. Tansley and Mr. Price Evans believe that the most profitable approach to the study of ecology in the school is by parallel and unified studies of local geography and regional surveys. The teaching of ecology in schools has always presented special difficulties; the organisation of field work with large classes of pupils is a very real problem, which is further aggravated in industrial areas by the inaccessibility of suitable ground for study. These and other problems are discussed by the authors and suggestions are made for overcoming them, together with instruction in the elementary principles and practice of field studies in ecology, illustrated by chapters on the chief types of vegetation, both 'natural' and 'artificial', likely to be encountered. The ability to stimulate the interest of schoolboys and girls in field work and to inculcate successfully the ecological outlook must always depend upon the teacher's own interest and aptitude for such work, without which no book can act as a substitute. Given that, this book will be of great value in helping to solve many problems, in pointing the way to new possibilities in effective teaching, as well as providing details of field technique, and in demonstrating the potential cultural and educational value of the work attempted.

**Nature's Year** by Maribel Edwin, pp. 128, with 114 photographic illustrations. Longmans' Green and Co., 7/6. The theme of this book, which is intended for any intelligent reader with an interest in country life, is the responses called forth in animals and plants by the constantly changing environment throughout the seasons. The author draws widely on all branches of natural history for his material and keeps the reader's interest fully alive from beginning to end. Amongst other topics, facts and problems about hibernation and the migrations of birds, fish and butterflies are discussed, and the lists of questions bearing on the contents of each chapter will be welcomed by the thoughtful reader. A special word of praise must go to the selection and reproduction of the many admirable photographs which are the work of Hosking, Bastin and other well-known and top-ranking nature photographers.

**Eriophyes fraxinivorus** Nal.—This cauliflower-like gall has been plentiful this year on several Ash trees at Austwick; at least six trees on the Wharfe road were attacked and others a mile away to the west. These trees are constantly under observation for fruiting statistics and it is hardly likely that they have been previously attacked in this manner.

As the Ash is an intermittent fruiter and in odd years quite without fruit the question of the life history of the mite which causes the gall is an interesting one.

Mr. H. J. Burkill says he had a similar experience at Church Stretton in 1929. He says it seems as if the mites were very prolific in some years and then died away almost to extinction, but whether their abundance is due to some quality in the trees, or to weather factors, or their own nature is a problem we cannot pronounce upon.—CHRIS. A. CHEETHAM.



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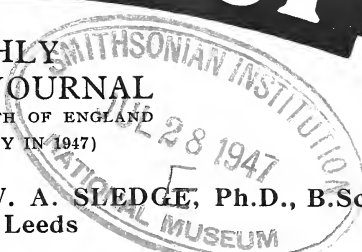
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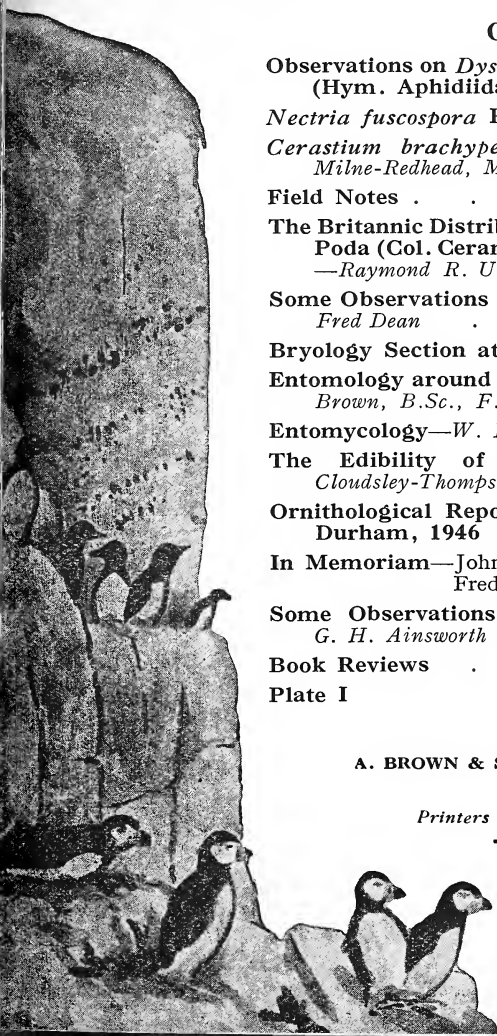
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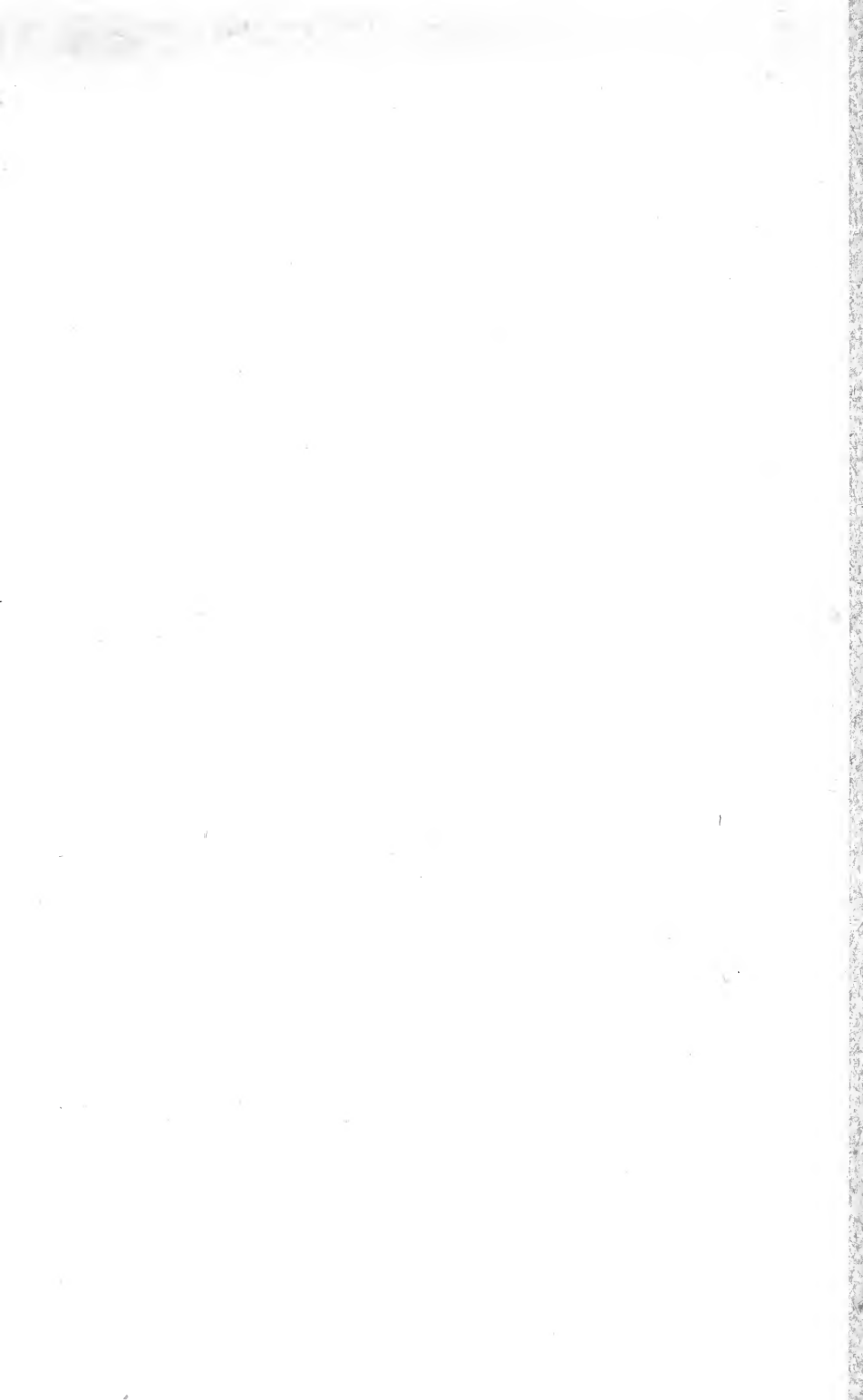
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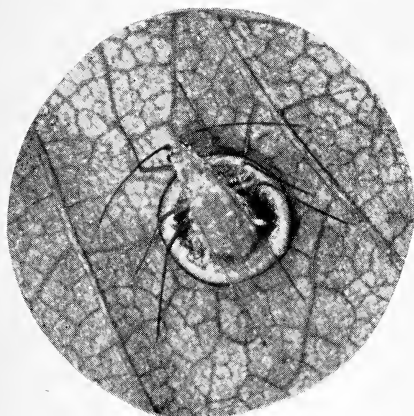


FIG. 1. Cocoon of *Dyscritulus planiceps*.



FIG. 2. *Praon* larva emerging from dead host.

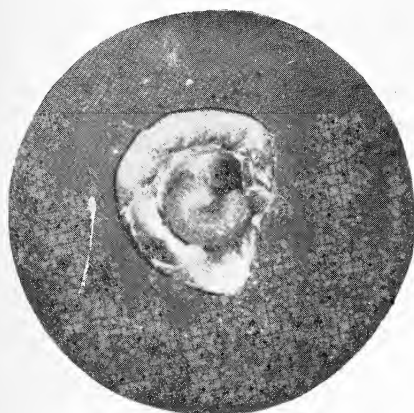


FIG. 3. Cocoon of *Dyscritulus* opened, showing normal larva.

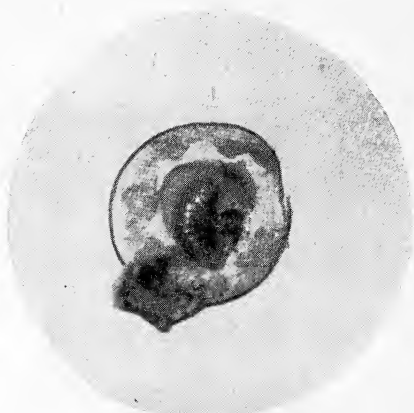


FIG. 4. *Dyscritulus* larva attached to wall of cocoon by glutinous tube-like membrane.

# **OBSERVATIONS ON *DYSCRITULUS PLANICEPS* (MARSHALL) (Hym. APHIDIIDAE).**

A. E. WINTER, F.R.E.S.

AFTER reading *An Entomological By-Path*, by Mr. W. D. Hincks, M.P.S., F.R.E.S., presidential address to the Y.N.U. at Halifax, December 1st, 1945, I became immediately interested in Green-fly parasites. Mr. Hincks generously gave me a specimen of the 'Shirt Button' cocoon for photographic purposes and has since encouraged and helped me in naming bred specimens.

From a collection of cocoons gathered in my own district, Scotton Banks, Nr. Knaresborough, during 1946, I have made the following observations.

On August 11th I found a full grown larva of *Dyscritulus* emerging from its host, the Sycamore Aphid, *Drepanosiphum platanoides* (Schrank). The full-grown larva cuts a slit in the ventral surface of the abdomen of the dead host and partly emerges. The larva then takes up a curved position with the dead Aphid perched upon its dorsal surface. The Aphid is then attached to the leaf with strands of silk, making the outline of the cocoon, which at this stage is transparent. Before proceeding further with the cocoon, the larva now weaves a thin circular 'mat' if I may so call it, of fine silk upon the leaf, slightly under 3 mm. in diameter.

The cocoon is now strengthened with more strands of silk under the dead host, and partly incorporating its under surface the larva weaves the raised circular dome, connected to the rim of the original 'mat,' leaving a flat area of about one third of the 'mat,' the latter has now a double layer of silk, resembling two separate skins. The cocoon is now further reinforced from the inside and at this stage becomes opaque. The upper or outer layer of this flat rim is of pale, straw-coloured silk, bordered by a very thin band, a sort of 'piping' of chestnut brown and brown again where the cocoon is raised from the flat portion to the dome. The inner cocoon measures approx. 1.5 mm., and is sealed off inside from the outer disc. The outer disc may be peeled off with a needle before revealing the wall of the inner cocoon connected to the base. The larva is situate in the top portion of the cocoon, which is smooth and polished. The allied genus *Praon*, cuts a slit in the ventral surface of the dead host, the larva making a simple conical-silken cocoon externally with the dead Aphid firmly fixed above. It would be interesting to know the reason for the extended development by the *Dyscritulus* larva of the outer rampart, the depressed circular outer ring. Would this be of any protection against predatory larva?

## **MODE OF ENTRY OF HYPERPARASITE.**

On opening up a series of cocoons during September, I found something abnormal about one *Dyscritulus* larva. Instead of the normal free larva in the dome of the cocoon, the larva was found to be attached to the lateral wall of the cocoon by a glutinous tube-like membrane. On my touching the larva with a bristle, causing considerable wriggling and stretching, it could not detach itself from this secretion.

The egg of the hyperparasite at the time of oviposition is attached to the cocoon wall by its chorion, and also closely grasping (sucker-like) the cuticle of its host, the latter cannot detach itself by attempted movement.

Although the parasite deposits the egg externally on the host after a period of a few days it enters its body, the final stage is endoparasitic. The connecting secretion then loses its glutinous properties and the host larva becomes free.

## **REARING THE ADULTS.**

The parasitised Aphids (or cocoons) attached to a *very small* portion of the leaf, were placed in small jars or tubes covered with fine muslin. The tubes were then placed in an air-tight screw top jar, packed round with damp cotton wool, and kept in a cool place. The above method proved satisfactory during the spring and summer months, when emergence is not delayed beyond 2-3 weeks and no trouble with fungi developed.

The last brood of *Dyscritulus* winters in the larval stage and is consequently prolonged: for this the above method is not satisfactory. The method adopted in this case was to remove the cocoons from the leaf and stick them on 3 in. x 1 in. micro slides with a trace of gum tragacanth. The purpose of this was two-fold: (1) The cocoons can now be opened for inspection, (2) the leaf support having been disposed of for storage, there is less chance of fungi damaging the specimens.

Finally, the slides were placed in tubes of suitable size, fixed with a muslin top and stored in air-tight screw top jars, above a saturated solution of sodium chloride. It is essential that mature larval or pupal stages be bred in conditions of optimum humidity.

## REFERENCES.

- HINCKS, W. D. (1944). On the 'Shirt Button' Cocoon *Dyscritulus planiceps*. *Naturalist*, 1944, 93-96.  
 HINCKS, W. D. (1946). An Entomological By-Path. *Naturalist*, 1946, 1-11.

**NECTRIA FUSCOSPORA PLOWR.**

T. PETCH

In Plowright's MSS., under date, June 23rd, 1888, there is a list of fungi identified for Mr. J. Atkinson, Bank, Bowness, which includes, '*Nectria fuscospora*; perithecia minute, dark red, naked, globose, papillate; asci cylindric; spores oval, uniseptate, pale brown,  $12 \times 5$  mik.' I was unable to find any record of that name and concluded that it had not been published. Recently, however, I found that Mr. Atkinson had published a 'New species of *Nectria*,' with a description as *Nectria fuscospora* Plowr. in *The Westmorland Note Book and Natural History Record*, December, 1888, p. 90, adding that it was found on an old shoe at Bowness. I have not seen the published description and am not sure it is the same as Plowright's, but according to the rules then prevailing, the name was validly published.

In 1903, Feltgen described *Nectria Westhoffiana* var. *coriicola* on rotting shoe leather. Von Höhnelt published a revision of Feltgen's species in 1906 and stated that the specimen was *Nectria ditissima*. But Weese, who also examined the specimen described it in 1912 as *Nectria inundata* var. *minor*. *Nectria inundata* has brown, smooth spores, which in var. *minor* are  $12-15 \times 5-6\mu$ . The latter appears to be *N. fuscospora* Plowr., or *Letendraea fuscospora* (Plowr.) Petch, because of its brown spores.

Weese, in *Beiträge zur Kenntnis der Hypocreaceen*, I (1916), p. 34, stated that *N. inundata* var. *minor* showed an evident relationship to *N. sanguinea* (Bolt.) Fr. in the form, colour and structure of the perithecium. He also stated (p. 44) that the perithecia of *Sphaerostilbe flavoviridis* Fuckel could not be distinguished from those of *N. sanguinea* and that the spores of the latter are quite smooth and hyaline, seldom faintly yellow (p. 35). But I have specimens which I take to be *N. sanguinea* on *Diatrype stigma*, in which the ascospores are minutely warted and hyaline, and others in which they are minutely warted and yellow; and it would appear that both features may depend on age.

*Sphaerostilbe flavoviridis* has a green stilboid stage with *Fusarium* spores up to  $36\mu$  long. Unfortunately I have never found that stage, all my specimens being perithecial only. In 1944 I found, at North Wootton, a small red *Nectria* on green patches on the sawn surface of a recent stump of *Pinus sylvestris* which had been felled the previous year. The wood was still hard and could not be cut with a pen-knife. The green film proved to consist of *Trichoderma viride* and algae, and the *Nectria* was *N. fuscospora*, the old ascospores being smooth and decidedly pale brown. In *Sph. flavoviridis* the spores are pale brown and minutely warted (Fuckel, Fung. Rhen., No. 2353).

If Weese's findings are accepted, we have the following classification of this puzzling group:

Ascospores hyaline or pale yellow, smooth—*Dialonectria sanguinea* (Bolt.) Cooke.

Ascospores brown, smooth—*Letendraea fuscospora* (Plowr.) Petch.

Ascospores brown, rough—*Letendraea modesta* (v. Höhnelt) Weese.

Ascospores brown, rough, with a sphaerostilbe conidial stage—*Sphaerostilbe flavoviridis* Fuckel.

Further investigation is required to establish the validity of this classification. I have included *L. modesta*, as it is possible that several British collections included under *Sph. flavoviridis* may have to be transferred to that species.



# CERASTIUM BRACHYPETALUM PERS. IN BRITAIN

E. MILNE-REDHEAD, M.A., F.L.S.

WHILST attending a field meeting of the Bedfordshire Natural History Society and Field Club on May 18th, 1947, I was, in company with my friends, Mr. V. S. Summerhayes and Mr. P. Taylor, exploring the banks of a cutting on the L.M.S. Railway between Sharnbrook (Beds.) and Irchester (Northants.), when I noticed a *Cerastium* with which I was quite unfamiliar. The plant, an annual, was growing in quantity among grasses and other native plants including *Cerastium viscosum* L. and *C. semidecandrum* L. In places it formed pure stands, and the long, spreading silvery hairs gave it a greyish appearance in contrast to the green plants around it. Examination of the specimens which I gathered proves it to be *C. brachypetalum* Pers. (Syn. 1, 520 : 1805), a species of continental Europe hitherto unrecorded for Britain, even as an alien.

*C. brachypetalum* is a variable plant especially as regards the indumentum. The Bedfordshire plant is entirely devoid of glandular hairs, and is var. *eglandulosum* Fenzl (in Ledeb., *Fl. Ross.* 1, 404 : 1842). A comprehensive synonymy is to be found in the recent account of *C. brachypetalum* by Lonsing (Fedde, *Rep. Sp. Nov.* 46, 156 : 1939) who treated our plant as subspecies *strigosum* (Fries) Lonsing. It is a matter of opinion as to what is the correct rank in which to place this glandless plant, but I personally prefer to treat it as a variety, for it has a very similar distribution in Europe to some of the glandular forms of the species.

The following is a description of *C. brachypetalum* as it occurs in V.C. 30, Bedfordshire.

*Annual*, 5.5—30 cm. high. *Stems erect*, single or up to 7 arising from the base, *villous*, greenish above, tinged with purple towards the base. Internodes progressively longer upwards, the uppermost internode 1.5 cm. in small plants to 5.5 cm. in the largest. *Basal leaves* (mostly faded in specimens available) lanceolate, narrowed into a rather broad petiole, acute at the apex, 5-14 mm. long, *thinly villous*. *Stem leaves* lanceolate or elliptic, sessile, 4-12 mm. long, acute, *thinly villous*. *Inflorescence dichotomous forming a lax panicle*, 3-31 flowered. *Pedicels* erect or ascending, *bent near the apex in fruit*, 6-15 mm. long, *villous*. *Bracts entirely herbaceous, thinly villous*. Flowers pentamerous. Sepals lanceolate, strongly concave, 4-4.5 mm. long, *herbaceous to the apex* and with scarious margin on the sides [if any] enclosed in bud, *thinly villous*. *Petals* about *half the length of the sepals*, bifid for one third their length, *sparsely ciliate on the margin below*. Stamens 10, as long as the petals, *with a few long spreading hairs towards the base of the filament*. Styles 5. *Capsule broad*, cylindric, slightly curved towards the apex, 5-7 mm. long, *slightly exserted from the calyx*. *Seeds* 0.5 mm. diameter, somewhat flattened, muricate, light brown.

BEDFORDSHIRE (V.C. 30), on bank of railway cutting between Sharnbrook and Irchester, ca. 90 m., May 18th, 1947, *Milne-Redhead* 5675 (Kew, B.M. & Luton Mus.).

For comparison I give a translation of the original description and citation by Persoon of *C. brachypetalum*.

Stem erect, tomentose, dichotomous ; leaves ovate, the lowest rosy ; inflorescence paniculate ; calyx villous, longer than the corolla. Grows in fields near Cenomanum (Le Mans) and elsewhere. Desportes. The stem is purplish at the base and is not sticky.

In the field *C. brachypetalum* var. *eglandulosum* has a definite grey-green appearance on account of its villous indumentum, and this coupled with its lax panicle at once separates it from any of the other annual *Cerastia* known to occur in Britain. In some respects large plants of it more closely resemble the perennial *C. vulgatum* L., but the absence of barren shoots, the small flowers and short capsules readily serve to distinguish it.

The more important diagnostic characters of the small flowered British species of *Cerastium* are given in the following key :—

- 1 (2) Plant perennial ; capsule twice as long as sepals ; petals usually considerably longer than sepals ; bracts with scarious margins ; stem hairy with short spreading hairs, with or without glands. *vulgatum* L.
- 2 (1) Plant annual.

- 3 (6) Bracts with scarious margins ; pedicels declining after flowering, finally erect in fruit ; petals slightly notched.
- 4 (5) Upper half of bract scarious ; petals with simple veins. *semidecandrum* L.
- 5 (4) Scarious margin of bract narrow ; petals with branched veins. *pumilum* Curt.
- 6 (3) Bracts entirely herbaceous ; pedicels always ascending ; petals deeply notched.
- 7 (8) Capsule twice as long as sepals ; stem erect, viscid ; pedicels in fruit about as long as sepals ; inflorescence compact ; base of petal and filament ciliate. *viscosum* L.
- 8 (7) Capsule as long as or slightly longer than sepals ; pedicels in fruit much longer than sepals ; inflorescence not compact.
- 9 (10) Stems erect ; plant villous ; petals about half as long as sepals ; stamens 10 ; base of petal and filament ciliate. *brachypetalum* Pers. var. *eglandulosum* Fenzl.
- 10 (9) Stems erect or diffuse ; plant viscid, never villous ; petals slightly shorter than sepals ; stamens 4-5 ; petals and filaments glabrous. *tetrandrum* Curt.

The distribution of *C. brachypetalum* is a wide one. If one includes *C. luridum* Guss., it stretches from southern Scandinavia to the Mediterranean and from Spain to the Caucasus. It occurs in the Balearic Islands, Sicily, Crete and Cyprus and in Algeria. It is said to be found over practically the whole of France, but Lonsing (l.c.) does not show any records for the north coast. It is absent from Holland and Belgium. *C. brachypetalum* var. *eglandulosum* is essentially a central European plant reaching northern Italy in the south. Lonsing admits an occurrence in Denmark, one in Spain and one in Roumania.

*C. brachypetalum* inhabits dry hillside and stony places and does not appear to be particular as to soil provided the drainage is good. It is reported from jurassic limestone, siliceous and granitic soils. In Bedfordshire the cutting in which it was found is cut through the Great Oolite series, but the actual bed on which the plant was growing has not been ascertained. Judging by the associated plants the soil was not markedly calcareous.

The status of the plant in Britain is naturally doubtful. I am inclined to consider it a comparatively recent introduction, but the possibility that it is a native plant which has hitherto escaped detection cannot be entirely ruled out. It is probable that it has been in this railway cutting for many years. It was in large quantity over a considerable distance, the exact extent of which was not observed. It was holding its own with many native species, both annual and perennial, including *C. viscosum*, a species with which it is said often to be associated on the continent. It is possible that further search in suitable localities here and in other parts of the country may reveal *C. brachypetalum* in more natural habitats, when it might stand a stronger chance of being promoted from the status of denizen to that of a native plant.

## FIELD NOTES

***Spergula pentandra* L. in England.**—About the end of April, 1943, I met with this plant growing in East Sussex under conditions apparently similar to those obtaining in its habitats in France and Germany. I have recently revisited the locality and found it in some abundance.

I hope shortly to give an account of it and its history in British botany.—H. W. PUGSLEY.

***Riccia glauca* L. var. *subinermis* (Lindb.) Warnst.**—Dr. J. M. Taylor, while examining gatherings of *Riccia glauca* from near the railway crossing on the Barnby Dun-Stainforth road, near Doncaster, V.C. 63, noticed the presence of cilia or hairs on the thallus of some of his specimens. Plants were submitted to Dr. W. Watson who named them *Riccia glauca* L. var. *subinermis* (Lindb.) Warnst. This variety had not previously been recorded for Yorkshire.—H. WALSH.

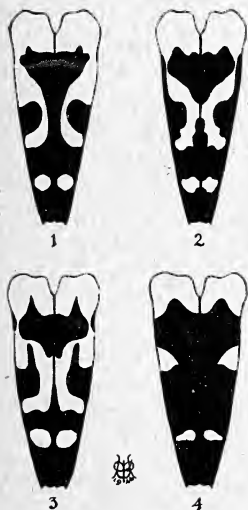
# THE BRITANNIC DISTRIBUTION OF *STRANGALIA MACULATA* PODA (Col., CERAMBYCIDAE) AND ITS ABERRATIONS

RAYMOND R. U. KAUFMANN

*Strangalia maculata* Poda may well rank as one of the most widely distributed British Longicorns; there are very few counties and vice-counties in England from which it has not yet been recorded. In Wales and Scotland the position is less happy; in the former it has occurred all along the extreme western coastline and to a certain extent in the south; central Wales, however, remains to be worked more thoroughly for the species. Scottish records are most meagre. The species is evidently very rare there, and such captures as have been made occurred many years ago in one county only, and the insect has not apparently been seen since. In Ireland, records are equally few, though Stelfox (1937) observes that *S. maculata* may probably be generally distributed there, and the fact that it has not been recorded from some counties is due rather to the scarcity of observers than to the scarcity of the beetle itself; nevertheless, of the forty divisions into which the country is divided, only eight have so far produced the insect, mostly in the south-east and south-west. As regards its island distribution, *S. maculata* is only known to occur in the Isle of Wight; the Scillies and Lundy are evidently unsuited to it (there is only one Longicorn record from the Scilly Islands and none from Lundy); nothing is known of it from Anglesey, though there does not seem to be any strong reason for supposing that it should not occur there, and Britten informs me that no Longicornia have as yet been taken in the Isle of Man.



Distribution of *Strangalia maculata* Poda.



Figs. 1-4.

Elytra of *Strangalia maculata* Poda.  
1, *a. sylvestris* nov.; 2, *a. kricheldorfii* Wagner; 3, approaching *a. alsatica* Pic; 4, *a. bifenestrata* Pic.

In spite of its general distribution in England, *S. maculata* is somewhat local in its range, but it is often quite common within its immediate surroundings. Its principal pabulum appears to be the birch, but it is by no means confined to this, and it may be taken from a variety of decaying trees, including ash, aspen, hornbeam, oak and willow; it emerges, too, from old posts and may be beaten from hawthorn blossom, wildrose, rambler roses, hazel and bracken; it has also been taken from off the following flowers: brambles, *Heracleum*, *Angelica*, raspberry blossom, thistles, *Viburnum*, *Spiraea*, *Achillea*, honeysuckle, leek flowers, sweet william, *Enanthe*, *Philadelphus* and privet blossom. On hot days it is more active and can be taken on the wing; it drops readily to ground if disturbed, though curiously enough, it clings tenaciously to Umbelliferous flower heads on windy days. The months of its occurrence are May to September, and I know of no earlier or later times than these.

*S. maculata* is perhaps the most prone of any of our Longicornes to colour variation, and these forms are very stable. In my experience, the aberrant insects are more common than the type. In the following table the number of maculations in forms



1 to 9 refer to the one elytron only in each case ; this seems a simpler form of description than taking the anterior fascia as a whole.

#### KEY TO THE ABERRATIONS OF *Strangalia maculata* Poda

- Anterior fascia absent, incomplete or consisting of a variable number of spots. Remaining fasciae normally separated at the elytral edges, but occasionally fused externally ; this is almost invariably so with the third and fourth fasciae ; second and third fasciae are generally separated.
- 1. Anterior fascia completely absent.———*a. impunctata* Muls., 1839.
- 2. Anterior fascia consisting of one spot, placed either externally, centrally, or next to the suture. The first is the commonest form.———*a. externepunctata* Muls., 1839=*calcarata* Oliv., 1790.
- 3. Anterior fascia composed of one spot, common to the suture. Legs completely black.———*a. extrema* Wagner, 1928.
- Anterior fascia consisting of two spots, one of which is external.
- 4. Remaining spot placed centrally, either confluent or divided.———*a. mediopunctata* Kaufm., 1946.
- 5. Remaining spot placed next to the suture or common to it. Legs normal.———*a. binotata* Muls., 1839.
- Anterior fascia consisting of three or more spots, variable in size and generally well-defined ; occasionally they are much reduced. Spots respectively at the external edges of elytra, centre (either fused, fragmentary or divided, often cordiform) and at the suture.
- 6. With three spots ; one external, one central and one common at the suture.———type form *maculata* Poda, 1761=*a. elongata* Deg., 1775=*armata* Herbst, 1784=*calcarata* F., 1792=*punctatofasciata* Muls., 1839.
- 7. Similar, but with second fascia reduced to a rudimentary marginal spot. Antennae black.———*a. nigricornis* Stierlin, 1864.
- 8. Identical with the type form, except that the sutural spot is sharply separated.———*a. separata* Kaufm., 1946.
- 9. With more than three spots ; one external, the central spot variable and broken up into two or more fragments, and the sutural spot common.———*a. subspinosa* F., 1792.
- Anterior fascia confluent across elytra, generally including suture. External spots either separate or fused with the others. Second and third fasciae separate or at the most lightly joined at the elytral edges.
- External spots separate.
- 10. Fusion light and sub-triangular.———*a. seminotata* Kaufm., 1946.
- 11. Fusion heavy and strongly triangular.———*a. disconotata* Pic, 1908.
- External spots also confluent.
- 12. Fusion broad and heavy, produced anteriorly at the centre to a peak, giving an undulate effect.———*a. undulata* Muls., 1839.
- 13. Anterior fascia fused additionally with second fascia along elytral edges. Lateral confluence at first fascia either angular or strongly sinuate, but lighter and less pronounced than in the last named.———*a. conjuncta* Kaufm., 1946.
- 14. Anterior fascia fully confluent except at suture, where there is a complete interruption.———*a. manca* Schauff., 1863.
- Anterior fascia complete or interrupted at edges, very broad, strongly sinuate and either produced posteriorly along suture to meet third fascia (which is similarly produced anteriorly), or else these productions are interrupted centrally and opposite to the second fascia, which remains separate though joined externally to third fascia to a major or minor extent.
- Sutural production complete.
- 15. Anterior fascia entire. A very dark form.———*a. suturalis* Kaufm., 1946.
- 16. With the external spot of the anterior fascia completely absent (Fig. 1).———***a. sylvestris nov.***
- Sutural production sharply interrupted at centre, usually dentiform.
- 17. Anterior fascia complete.———*a. dentato-suturalis* Kaufm., 1946.
- 18. Anterior fascia with the external spot separated and more broadly joined externally to second fascia (Fig. 2).———*a. kricheldorffi* Wagner, 1928.
- Anterior fascia complete or interrupted, broad and strongly sinuate.
- 19. Second fascia entire, meeting at suture.———*a. sinuata* F., 1792.



20. Second fascia broken, though complete across suture.———*a. pignetensis* Pic, 1912.
21. Second and third fascia fused, except at suture, but separate from anterior band. General appearance strongly melanic from centre to apex of elytra.———*a. apicalis* Kaufm., 1946.
22. All four fasciae much dilated and fused along suture and with one another. Yellow maculations greatly reduced, and the elytra are largely black in colour.———*a. dayremi* Pic, 1910.
23. With a supplementary spot in between the first and second fasciae, either separate or uniting the two former.———*a. alsatica* Pic, 1910.
24. Almost black; with only the elytral base sinuously yellow, and with two yellow ante-median and ante-apical spots (Fig. 4).———*a. bifenestrata* Pic, 1933.

This key contains most of the forms described from the Continent, likely to be found here in this country, but omits two aberrations which differ chiefly in the appearance of the pronotum. It will be seen that *S. maculata* varies very strikingly from a pale colour, in which the elytral shoulders are largely yellow, to a very dark type with the wing-cases strongly melanic and the yellow spots greatly reduced. Picard (1929) implies that the dark specimens are northerly in their range: this does not appear to be so in this country, and the same locality may produce examples showing all the gradations in colour.

#### DISTRIBUTION OF THE TYPE FORM

*England*—BEDS. (BD): Bluebell Wood, Fancott, King's Wood, Leighton Buzzard; BERKS. (BK): Bradfield, Cothill, Easthampstead Park, Newbury, Reading, Tubney Woods, Wellington College, Windsor Forest, Wytham; BUCKS. (BX): Chorley Wood, Hell Coppice, Shabbington Wood; CAMBS. (CB): Cambridge, Doddington, Haileybury Wood; CHES. (CH): Bowdon, Burton Wood, Delamere Forest, Dunham Park, Ellesmere Port, Pettypool Wood, Raby Mere; CUMBERLAND (CU): Barron Wood, Caldbeck, Cummersdale, Eskdale, Keswick, Latrigg, Newbiggin Wood; DURHAM (DM): Axwell, Durham, Gibside, Lamesley, Shotter Bridge, Winlaton-on-Tyne; DORSET (DT): Bloxworth, Glanvilles Wootton, Iford, Moreton, Parkstone, Rempstone Heath, Upper Bockhampton, Wimborne, Wool; DERBY (DY): detailed particulars are not available, but Tomlin (1905) lists it in the *Victoria County History*; E. CORNWALL (EC)\*§: Bodmin, Coombe Valley, Looe; E. KENT (EK): Ashford, Blean Woods, Bredhurst, Chatham, Chilham, Lordswood, Lyminge; E. NORFOLK (EN): Horning Fen, Horsford Heath, Hoveton, Wheatfen Broad; E. SUFFOLK (ES): Barnby Broad, Bentley Woods, Burgate, Ipswich, Lound Wood, Lowestoft, Orwell Valley, Trimley; E. SUSSEX (EX): Balcombe, Burgess Hill, Crowthorne, Forest Row, Hastings, Laughton, Whitefield Woods; E. YORKS. (EY): Buttercrambe Wood, Forge Valley, Hayburn Wyke, Helmsley, Kilton Wood, Langdale, Ramsdale, Saltburn, Scarborough, Sessay; E. GLOS. (GE)\*: Benhall Farm, Gloucester, Rendcomb; W. GLOS. (GW)\*: Forest of Dean, Lydney, Shaw Common; HEREFORD (HF): Black Mountain, St. Weonards, Symonds Yat, Treago†, Werndee†; HERTS. (HT): Cheshunt†, Felden, Harpenden†, Hastoe, Knebworth Great Wood, St. Albans, Turner's Hall†, Welwyn, Wormley Wood; HUNTS. (HU): Brampton, Monks Wood, Wood Walton Fen†; ISLE OF WIGHT (IW): Newport, Ningwood, Parkhurst Forest, Sea View, Shanklin, Whitefield Woods; N. Lincs. (LN): Ashby, Burwell Woods†, Hainton†, Haugham†, Langworth Wood†, Legbourne Wood†, Linwood†, Louth, Newball Wood†, North Wood†, Toynton-All-Saints†, Tumbly, Woodhall Spa; LEICS. (LR): Barkby Holt, Buddon Wood, Gumley, Litton, Owston Wood; MID-LANCS. (ML): Silverdale; MONMOUTH (MM): Dixon Newton, near Monmouth; MDDX. (MX): Enfield, Mill Hill, Wilkinson's Wood; MID-WEST YORKS. (MY): Askham Bog, Bishop's Wood; N. DEVON (ND): Bampton†, Barnstaple, Braunton, Clovelly, Croyde, Heddons Valley, Lynton, Mortehoe; N. ESSEX (NE): Colchester; N. HAMPSHIRE (NH)\*: Andover, Crookham, Harewood Forest, Pamber Forest, Winchester; NOTTS. (NM): Aldercar Wood, Beauvale Woods, Bevercote Park, Epperstone Park, Kneesall Wood, Laxton Wood, Ollerton, Oxtan Wood, Retford, Roe Wood, Sherwood Forest, Treswell Wood, Warsop, Wellow Park, Whip Ridding, Wigsley

§ Cornish records are not detailed in the County History, so these are here treated as new ones.

Wood; NORTHANTS (NO): Easton Hornstocks†, Fawsley Park, Wakerley†, Wansford; N. SOMERSET (NS)\*: Holcombe, Oakhill†; OXON. (OX): Headington Wick†, Langridge Wood, Oxford, Stanton St. John; S. DEVON (SD): Axminster, Beer, Bickleigh Vale, Bovey Tracey, Cann Woods, Caton, Colyton†, Dartmoor, Dunsford, Ermington†, Hall Sands, Holnet†, Morganhayest†, Shute Park, Stoke Wood, West Hill, Whimble; S. ESSEX (SE): Brentwood, Chingford, Epping Forest, Hainault Forest, Ongar Park Wood; S. HAMPSHIRE (SH): Brockenhurst, Eastleigh, Lee-on-Solent, Lyndhurst, Netley Heath, New Forest, Ringwood, Southampton; S. LANCs. (SL): Manchester, Pooltown, Rixton Moss; S. NORTHUMBERLAND (SN): Haydon Bridge; SURREY (SR): Ashted Wood, Boxhill, Brookwood, Byfleet, Chiddingfold, Claygate, Coombe Wood, Effingham, Epsom, Godstone, Gomshall†, Hascombe, Leatherhead, Merstham, Mytchett, Oxted, Oxshott, Polesdon Lacey, Selsdon, Weybridge, Wyke Farms; S. SOMERSET (SS): Minehead; STAFFS. (ST): Abbots Bromley, Acton, Bishops Wood, Burnt Wood, Cannock Chase, Dovedale, Hawksmoor Nature Reserve, Madeley, Trent-ham Park; S. WILTS. (SW): Dinton, Franchises Wood, Ludgershall; S. YORKS. (SY): Allerthorpe Common, Brighton, Bridlington Quay, Skipwith, Thorganby; W. CORNWALL (WC)\*: Millhook; W. KENT (WK): Chattenden, Cobham Park, Darenth Wood†, East Malling, Mereworth, North Cray, Tunbridge Wells, Westerham, West Wickham; WESTMORLAND (WL): Witherslack; WORCS. (WO): Bewdley Forest, Hartlebury, Randan Wood; W. SUFFOLK (WS): Bury St. Edmunds, Raydon Woods, Sudbury; WARWICKS. (WW): Bubbenhall, Corley, Haywood, Knowle, Waverley Wood; W. SUSSEX (WX): Ditchling, Hurstpierpoint, Lower Beeding, Marley, Rowhook; S.W. YORKS. (WY): Askern, Barnsley, Cawthorne, Doncaster, Hampole, Haw Park, Huddersfield†, Knottingley, Margery Wood, Ryhill, Sheffield, Shirley Pool, Storthes Hall, Thorne Waste, Wakefield, Wharnciffe Woods.

Wales—CARDIGAN (CD): Llangorwen; CARNARVON (CR): Roe Valley, Snowdon; GLAM. (GM): Castell Coch, Cwrt-yr-Ala, Llandaff, Sketty Burrows, Swansea; MERIONETH (MN): Cwm-yr-afon, Fairbourne, Rhydymain, Towyn; PEMBROKE (PB): Canaston Woods, Cresselly, Mynachlogddu, Saundersfoot, Tenby.

Scotland—KIRKCUDBRIGHT (KB): Little Ross, Orchardton.

Ireland—CARLOW (CW): Borris; DOWN (DO): near Belfast; KILKENNY (KK): Thomastown, Woodstock; N. KERRY (NK): Killarney, Upper Lake; S. KERRY (SK): Glencar, Kenmare, Waterville; SLIGO (SL): Lough Gill; W. CORK (WC): Glengarriff; WICKLOW (WI): Avoca, Dargle, Devil's Glen, Powerscourt, Rathdrum.

#### ABERRATIONS

- a. impunctata* Muls.—SR\*: Wimbledon Common.
- a. externepunctata* Muls.—IW: Brittlesford; LN: Langworth Wood†; SD: Holnet†; SR: Gomshall†; WK\*: Darenth; WI\*: Devil's Glen. Hardy Collection, data-less, Manchester University.
- a. mediopunctata* Kaufm.—EN\*: Horsford; LN: Burwell Woods†, Hainton†, Haugham†, Legbourne Wood†, Newball Wood†; NS\*: Castle Carey; SD: Combe Raleigh†, Holnet†; SR: Gomshall†, Ockham†, Wimbledon Common; WK: Cobham Park†.
- a. binotata* Muls.—IW: Firestone Copse; NO: Wakerley†; SH\*: New Forest; SR\*: Horsley; WY: Askern.
- a. nigricornis* Stierlin—IW: Firestone Copse.
- a. separata* Kaufm.—BK: Windsor Forest†; CH: Illidge Green†; EC: Bodmin†; EX\*: Laughton; HF: Trego†; HT: East Hyde†, Harpenden†, Kinsbourne Green†, Knebworth Great Wood†; LN: Langworth Wood†, Newball Wood†, North Wood†; ND\*: Lynton; NO: Easton Hornstocks†, Wakerley†; NS\*: Castle Carey; SD: Ashclyst Forest, Caton, Combe Raleigh†, Countess Wear, Ermington†, Holnet†, Stoke Woods; SH: New Forest†, Ringwood†, Southampton†, SR: Gomshall†; SW\*: Dinton; WW: Corley, Knowle†. There is a specimen without data in the Sidebotham Collection, Manchester University, and two similar examples in Warrington Museum.
- a. subspinosa* F.—EN\*: Hoveton; LN: Legbourne Wood†; SH\*: New Forest; SR: Chiddingfold—a specimen *in coll.* J. L. Henderson approaching this: it has the fragmentary central spots with the divided sutural spot of *a. separata*

Kaufm. This aberration is mentioned by Marsham (1802), Stephens (1829), Waterhouse (1858) and Crotch (1863); thereafter it is dropped from the British catalogues. An example without data label exists in the collection at Warrington Museum.

- a. *seminotata* Kaufm.—BK: Windsor Forest†; ND\*: Lynton; NH\*: Pamber Forest; SH\*: New Forest.
- a. *disconotata* Pic—EC\*: Callington; EY: Helmsley†; HF: Treago, Wern-dee†; LN: Burwell Wood†, Hainton†, Haugham†, Kenwick Wood†, Legbourne Wood†, Linwood†, North Wood†; LR: Barkby Holt†; MY: Askham Bog†; ND\*: Heddons Valley; SD: Caton†, Countess Wear, Ermington†, Holne†, Longdown, Poltimore, West Hill; SH\*: New Forest; SS\*: Wellington; SW: Dinton†, Franchises Wood; WW\*: Lapworth; WY: Milnsbridge†, Storthes Hall†. An unlabelled specimen in the Sidebotham Collection. Figured by Stelfox (1937), so it presumably occurs in Ireland.
- a. *undulata* Muls.—HT: Harpenden†, Kinsbourne Green†, Knebworth Great Wood†; LN: Langworth Wood†, Legbourne Wood†, North Wood†; SH: New Forest, Southampton†; SR\*: Gomshall, Wimbledon Common; WW\*: Corley, Umberslade; WY: Askern. A specimen *in coll.* Hardy, Manchester University. This form is figured by Shaw (1806) and by Spry and Shuckard (1840).
- a. *con uncta* Kaufm.—EN\*: Hoveton; SD: Caton†, Ermington†, Holne†, Shute Park†, West Hill; SR\*: Chiddingfold; WK\*: Darenth; WI\*: Devil's Glen, Rathdrum. Examples are to be found in both Hardy and Sidebotham Collections.
- a. *manca* Schauff.—LR: Buddon Wood†.
- a. *suturalis* Kaufm.—BK\*: Bagley Wood; LN: Legbourne Wood†, Linwood†; SH: New Forest†; WO\*: Wyre Forest. Illustrated in Rye (1866).
- a. *syvestris* nov.—LR\*: Martinshaw Wood†, 25/8/1945, a ♀ sent to me by D. Tozer.
- a. *dentato-suturalis* Kaufm.—BK: Easthampstead Park, Reading†; LN: Burwell Woods†; NM: near Ollerton†; SD: Ermington†; WC: Millhook†. There is an example *in coll.* Sidebotham.
- a. *sinuata* F.—I have not so far seen any specimens of this aberration. It is, however, referred to by both Marsham and Stephens. A. H. Newton has a form with the suture of *a. suturalis* Kaufm. and the entire second fascia of *a. sinuata* F., taken SD: Yealmpton, 20/7/1942.
- a. *apicalis*, Kaufm.—HT: Aldwickbury†, Chorley Wood; SR: Chiddingfold, Gomshall†, Merstham; WO\*: Wyre Forest; WW\*: Umberslade. Sidebotham Collection, one specimen data-less. Figured by Donovan, 3: pl. 84, f. 4.
- a. *dayremi* Pic—EX\*: Balcombe; LN: Legbourne Wood†, Muckton†.
- a. *alsatica* Pic—I have not seen a true form of this, but I have an example from LN: Legbourne Wood, which closely approaches this aberration. It is a micromorphous female, 12.5 mm. long, taken on 5/8/1946 by E. C. Riggall, having the second fascia produced to a peak which almost touches the confluent first fascia (Fig. 3).
- a. *bifenestrata* Pic—NM\*: Sherwood Forest; WO: Wyre Forest, a form approaching this.

In these locality lists, new county and vice-county records are marked with an asterisk (\*); the dagger (†) indicates the existence of specimens *in coll. mea*.

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## SOME OBSERVATIONS ON A COLONY OF WATER VOLES

FRED DEAN

THE colony of water voles at the mill dam mentioned in my earlier note (*Naturalist*, 1946, p. 153), started off at the beginning of the year in full numbers and strength. The banks on each side held their full quota of voles. With numbers like this at the beginning of the year (February and March) I wondered what would be the outcome when the litters of the full season were added to them ; and it was this thought which prompted me to a keener and closer study of this particular colony, month by month. Other people commented on these numbers and were well aware of the voles' constant *ploppings* in the water almost every few yards.

The young shoots of the grasses and smaller plants which grow in damp places were kept constantly short. The effect of the constant clipping of, say, a foot to a foot-and-a-half in some places, tended not only to ensure a fresh clean growth, but like most lawns and fields that are cut fairly regularly, this grass was thick and close growing and for a time at least seemed to be their chief food. The other nearby growths they left uncut, the dividing line being so distinct that it showed up clearly and conspicuously on photographs. Even later in the year the voles never encroached upon the uncut areas for food, but on occasion used it for nesting material.

Just prior to the arrival of the first litters (early in May), new holes were dug into the short clipped sods, and the voles' well-trodden runways became easier to follow, and their jumping-off places became worn bare. The holes below water at this place must have been numerous too, for later in the year, owing to the constant play of the water both in them and under the banks, yard upon yard of the bank gave way and fell down into the bottom of the dam.

Later in May other plant growths began to enter the vole menu. Common Watercress seems to be well favoured. To one large bed of this plant the voles nearby would make regular journeys, arriving and returning on the water surface. Plenty of incidents happened in and about this Watercress bed. Some could be easily observed, others could only be imagined where the cress grew high and covered up their activities.

Where male vole meets male, especially in the spring and summer months, these aggressive creatures fight viciously. This they do both above and below water. In most cases of this kind, the younger or weaker vole uses discretion and immediately gives right of way and takes himself hurriedly away. The real trouble begins when the more equally matched voles meet ; for a split second there is some teeth chattering, and bristles seem to be raised as they jockey for position. These preliminary stances take up less time than the writing of them. The fight starts almost too quickly for the eye to follow ; teeth and claws come



into play at a marvellous speed, feint and false grip and the act is repeated. They seem to work themselves up into a fit of fighting fury, and the very fierceness of it whilst it lasts is outstanding. Quite often, even after the vanquished has disappeared, the victor will strut about angrily or swim up and down as if half expecting to be again attacked should he be off his guard for a moment. Females too are not above a squabble or two, but in this they cannot compete with the males.

It is often stated that the brown rat kills the water vole, but I witnessed a short fight under water between a buck brown rat and a buck water vole when, after a few sharp bites in which the water vole did its share, they quickly separated, and both seemed eager to get away from the other.

On one occasion, just after a flood, the water rose so rapidly that most of the voles were forced out of their runs and made off down the dam to find higher ground. One female only swam back into this water-logged area. Her errand at the time could not be clearly understood, but later she came out again carrying one of her young gripped by the scruff of the neck and held high out of the water as she swam with it into a low wall on the opposite bank just below me. Five journeys were made and each time she returned carrying one of her precious young. On the last journey she dropped her burden on the edge of the wall and took a fresh grip of it, but this time not by the back of the neck, and being by now almost exhausted by her remarkable feat, fell rather than walked down into this new-found home. A few weeks later at this place, after the water had regained its normal level, a weasel caught a partly grown vole by the hind parts as it tried to escape from a rather small hole. Just a short scream and it was all over; the weasel had it now by the throat and dragged it out of sight into the weeds.

As the year advanced (June and July) the vole colony still increased almost to overcrowding. It was then that the pair of tawny owls arrived, bringing with them two of their fully-feathered juveniles. Most evenings, early at that, they could be seen and heard in the trees, which in some places overhung this dam. Perhaps it was because of these owls, which seemed to be in constant evening attendance, that the voles could be seen out feeding at all times during the daylight hours. At dusk it seemed not a vole was abroad. In addition to the owls, two poaching cats began to choose the dam bank as their hunting ground, one at the top end and the other at the bottom. These cats became expert vole catchers. I saw one catch a vole with one foot almost in mid-air as the vole was attempting to do a backward jump into the water. Some of the voles caught were not eaten but just taken home and laid on the cats' respective doorsteps. These cats took a heavy toll of the voles and young birds as they extended their prowls to cover almost the complete length of the dam. They hunted this ground daily and kept turning up in all kinds of odd places—in the trees, in the ends of drains or well concealed under the natural cover of the ferns. Once, when we had released an injured half-grown water hen, just as it reached the opposite bank, it vanished, pulled in by one of these cats which until then had been completely hidden.

The number of water voles by now had lessened considerably, and they were much more wary than before. They ate hurriedly, and if undisturbed consumed enormous quantities of food at one sitting. As previously recorded in *The Naturalist* a whole Hemlock plant, flower, leaves and stem, was eaten by one adult male. At one place where the common Shepherd's Purse grew in profusion, this was grabbed by the forearms, squeezed together and eaten lengthways. The buds and younger shoots of the Willows entered into their daily fare; these trees being aslant over the water, gave the voles excellent cover. Vetch and some Red Clover, Greater Plantain, Ribwort Plantain and fallen Sycamore leaves were also freely eaten stem first. Some plants, however, they seemed strictly to avoid, even though these plants were at least as convenient as the others to obtain, viz., Balsam, Meadowsweet, Forget-me-not, Valerian and Enchanter's Nightshade.

In June and July breeding was still going on, and although youngsters of varying ages could be seen (it was the flush time for vole numbers) the vole colony as a whole had been depleted. With the floods of August and November came further disaster for the voles of this particular dam. The dam burst its banks at the top end (maybe the voles had contributed to this burst), and to save further damage almost all the water was let off, apart from a mere trickle in the centre sufficient to feed the mill below. Mudbanks appeared, twenty to thirty yards in length and although this did not seem to upset the water hens and their partly



grown broods, the watery escape routes of the water voles were no longer there to assist the voles from the danger of their enemies. At the time of writing (late November) this dam is still empty, and the voles for some reason or other are making their way upstream. One would have thought that at this time of the year the tendency would have been downwards. Five voles have been caught in mole traps a good mile above this dam, altitude about 450 ft. One of these had a white tail ending, both in skin and hair. Others have been caught by dogs whose owners were ferreting for the brown rat. Incidentally a few water shrews were also to be found earlier in the year, when the dam was at its normal level.

As the year drew towards its close the voles still kept well in advance of the darkness for the purposes of feeding. The owls and the cats are still there.

My only other notes on the water voles refer to some incidents which occurred on November 13th on our local canal. There is here a smaller colony than the one previously mentioned, and it attracted my attention by the rather quieter and unhurried movements of the voles. They were just steadily engaged in harvesting the seeds of the Aquatic Poa. The journeyings of the voles seemed to be from one side of the canal, where there is a low wall, well concealed by hanging blackberry and other plants, to the opposite side, where there is a well-established reed bed. To get at these Poa seeds, which would stand three to four feet high, the voles adopted a different method from that with the previously mentioned Hemlock, *i.e.* cutting it down. Instead, they sat up on their haunches and, using their two fore-feet like hands, levered the stem right down until it touched the ground. Then running on the bent stalk to keep it down, they clipped off the topmost part of the seed stem, balanced it equally in their mouths and swam back across the canal with the seeded portion, entered their burrows with it, and then returned for more. I assume this is being stored up for the winter months, as I never saw any of the voles eating it, although I had them under constant observation for a full forty minutes. These animals did, however, eat portions of other grasses and succulent stems in between times. For a few years now I have witnessed this carrying-in process at this time of the year, particularly at this place, and it does appear to me by the very repetition of it, that the water voles store up this food for the winter months as the adult voles' larder.

At the weaning stage the female uses only the softer and most tender shoots.

Another observation at this time of the year is that the bucks, although still not accepting the intrusion of other males, tend to be more tolerant towards them than in the spring and during the summer months. This, however, is what one would expect.

The water vole tends to seek out for its permanent habitat the areas of our streams which most resemble a pond or dam where the water level is constant. This seems important for their safety, *i.e.* escape routes, tunnellings and depth of water. We have quite a number of vole colonies around Hebden Bridge, both large and small. The largest is comparatively new, being of only a few years' standing. This is situated at a good 1,000 ft. up the Pennines, and is near our last-made reservoir, Gorpel Top. Two years ago when visiting this place to count up the numbers of resident breeding mallard and their young, at almost every yard, at least on the upper reaches of the left hand side and top parts of the reservoir, water voles were to be seen.

The water vole is pestered by large numbers of biting lice, and it was noticed that quite a lot of the voles' time on land was spent in scratching, especially on the nape of the neck and between the ears. Often the voles attended to their toilet before feeding, but these lice on occasion were so troublesome that they had to be attended to during mealtimes.

## BRYOLOGY SECTION AT BOLTON WOODS

In early April a few members of the Section met in Bolton Abbey Woods. New contacts were made and a pleasant and instructive time passed quickly. Although many mosses were seen and their characteristic features examined, all had previously been recorded. Amongst the hepatics collected were *Madotheca platyphylla* and *Scapania nemorosa* which although expected for this area had not previously been noted; *Lophozia Muelleri*, a new find to the writer, had only previously been recorded from here in Pearson's book on Hepatics (1902). H. WALSH.

## ENTOMOLOGY AROUND ROBIN HOOD'S BAY

JAMES M. BROWN, B.SC., F.R.E.S.

THIS is the fifth contribution to this series of papers, and is confined to an account of the distribution of the aquatic Hemiptera (Water-bugs) which I have obtained in this district. The Fylingdales area is not well provided with bodies of fresh water suitable as habitats for these insects, most of the available pieces of water being of the nature of small pools either associated with farms, or as roadside ponds, some being much contaminated by cattle, and showing no great variety of character. In addition, two or three rapid streams with stony beds provide some sheltered backwaters where certain species may be found. The water bodies

TABLE SHOWING THE NUMBER OF *Corixas* COLLECTED IN THE VARIOUS HABITAT TYPES

Species.	Silt pools.	Detritus pools.	Crater A.	Craters B & C.	Sphagnum pools.	Running water.	Water troughs.	Totals.	% of total.	No. of habitat types.
<i>C. punctata</i> . . .	18	36	17	39	7	—	1	118	5.5%	6
<i>C. dentipes</i> . . .	—	—	—	1	—	—	—	1	—	1
<i>C. venusta</i> . . .	—	—	—	24	3	—	—	27	—	2
<i>C. limitata</i> . . .	—	4	5	2	—	—	—	11	—	3
<i>C. lateralis</i> . . .	88	40	256	34	—	—	14	432	21.5%	5
<i>C. nigrolineata</i> . . .	40	275	159	172	16	15	61	738	36.5%	7
<i>C. linnei</i> . . .	—	2	1	—	—	—	—	3	—	2
<i>C. sahlbergi</i> . . .	6	228	1	71	—	1	1	308	15%	6
<i>C. moesta</i> . . .	—	30	—	—	—	—	—	30	—	1
<i>C. castanea</i> . . .	—	11	4	97	19	—	—	131	6.5%	4
<i>C. scotti</i> . . .	—	—	—	1	—	—	—	1	—	1
<i>C. distincta</i> . . .	—	—	4	—	—	—	—	4	—	1
<i>C. praeusta</i> . . .	1	22	5	7	—	—	—	35	—	4
<i>C. wollastoni</i> . . .	—	3	—	152	8	—	—	163	8%	3
<i>C. germari</i> . . .	—	—	1	12	11	—	—	24	—	3
<i>C. concinna</i> . . .	—	—	5	—	—	—	—	5	—	1
<i>G. propinqua</i> . . .	—	—	—	8	6	—	—	14	—	2

Total 2,045.

which I have chiefly worked during the past few years can be very roughly classed (E. S. Brown, 1943, *T.S.B.E.*, p. 217) as :

- Silt ponds, with little or no vegetation, and muddy bottom (frequently much contaminated by cattle).
- Detritus ponds, with some vegetation or with vegetable debris on the muddy bottom.
- Peat pools, moorland pools of varying size, with peaty bottom and little vegetation.
- Sphagnum* or bog pools, moorland pools with some vegetation mainly *Sphagnum*.
- Backwaters of rapid streams.
- Cattle troughs (rather like diminutive silt pools), mainly on the cliffs.

In addition, and perhaps the most interesting, are three land-mine craters formed in the early part of the war, and which rapidly filled with water, forming good-sized pools. These are difficult to classify, not having reached a stable condition. Starting with no vegetation they have become colonised by quite a variety of plants and are rapidly becoming choked with vegetation. The first 'A' occurs in a pasture field at approx. 200 ft. above sea level, the others, 'B' and 'C' are on the moors at approx. 700 ft. above sea level. These have been

studied more fully in an attempt to trace out the successive insect invaders (and this may form the subject of a future communication).

As the Corixidae have been studied most assiduously and worked numerically they will be treated first, and the number of individuals taken in each type of habitat will be tabulated for each species. The numbers for the different habitat-types are not comparable as more visits were paid to some pools than to others, but the relative abundance of each species in each habitat-type can be fairly compared as on each occasion the insects were collected at random in the various pools, though not all the individuals netted were always retained.

#### NOTES ON THE SPECIES RECORDED FOR THE FYLINGDALES AREA CORIXIDAE

- Corixa punctata* (Illig.) a common species, present in all the habitat-types except running water. It seems therefore pretty catholic in its taste. It is not usually found in such large numbers as some of the smaller species, but represents between 5 and 6% of the individuals collected. (These numbers should be somewhat higher as not all the specimens netted were retained.)
- C. dentipes* (Thoms.) appears to be very rare as only one specimen has been obtained in the district. It occurred in the moorland crater 'C' at approx. 700 ft. This is only the second Yorkshire record.
- C. venusta* (D. & S.) very localised in its distribution, occurring only on the moors, in the craters 'B' and 'C' and in *Sphagnum* pools, where it is associated with the inflow. It is a species which may be expected in slow moorland streams.
- C. limitata* (Fieb.) not plentiful, but occurring in all three craters and one detritus pool. Its numbers are too small to deduce its preferences.
- C. lateralis* (Leach). One of the commonest and most plentiful species in the district, occurring in all the habitat-types except *Sphagnum* pools and running water, and representing 21% of all individuals taken. It is especially numerous in silt pools, and seems to favour those contaminated by cattle where it is frequently dominant, but it is not confined to these, occurring in large numbers in the mine craters, even those on the moors. It also is present sometimes in water-troughs. (It seems strange that I have no record of this very plentiful species in V.C. 63 or V.C. 65.)
- C. nigrolineata* (Fieb.). Undoubtedly the commonest and most abundant species about here, occurring in all the situations harbouring any species of *Corixa*. It is often present in very large numbers and represents 36% of all individuals collected. It is frequently sub-dominant in silt pools (even contaminated ones), dominant in detritus pools, very numerous in moorland pools, the most plentiful species in water troughs, and occurs in running water occasionally. It is very frequently associated with *C. lateralis*.
- C. linnei* (Fieb.) very scarce in the district, having been taken three times only in detritus pools, and never on the moors.
- C. sahlbergi* (Fieb.) another plentiful species representing 15% of all individuals taken, and occurring in all the habitat-types except sphagnum pools. It is especially numerous in detritus pools coming very close in numbers to *C. nigrolineata*.
- C. moesta* (Fieb.) appears to be very localised in this district. It has been taken very frequently and in fair numbers in only one detritus pool on the cliffs. This is quite a small pool with muddy bottom and a plentiful growth of rushes and grasses, and much decaying debris.
- C. castanea* (Thoms.). One of the most generally occurring species in moorland pools, whether containing *Sphagnum* or with a peaty bottom, but seldom found elsewhere. In this district, however, it regularly occurs with *C. moesta* in the detritus pool just mentioned. It is plentiful where it occurs, and represents 6.5% of individuals taken, and 18% of those taken on the moors.
- C. scotti* (Fieb.). This species might have been expected to occur in large numbers in the district, but so far I have taken but one specimen in crater 'C,' and this after several years of collecting in this pool. It is apparently a recent arrival and it will be interesting to see whether it colonises permanently. The only other Yorkshire locality recorded is an old record for Thorne, V.C. 63.
- C. distincta* (Fieb.) has occurred only four times in crater 'A.'

- Corixa germari* (Fieb.) appears to be confined to moorland pools, having been captured a number of times in the moorland craters and in *Sphagnum* pools, but not in large numbers. A single specimen, probably a chance arrival, occurred in crater 'A.' This is the only Yorkshire locality for the species.
- C. praeusta* (Fieb.). This usually plentiful species is not common in this area. It appears to favour detritus pools though not entirely confined to these, and seems to avoid pools contaminated by cattle. It has not often been taken on the moors.
- C. wollastoni* (D. & S.) commonly described as confined to pools above an elevation of 1,500 ft. in England, but I have shown (*E.M.M.*, 1945, p. 9) that it frequently occurs far below this altitude. In this district it is plentiful in various pools on the moors at elevations of only 700 ft. In craters 'B' and 'C' it seemed for a time to be the dominant species, but during the last years it appears to have somewhat decreased in numbers. It has also occurred erratically on three occasions in a detritus pool at low elevation (approx. 200 ft.). In numbers it represents about 8% of the total, and nearly 24% of the moorland captures.
- C. concinna* (Fieb.) scarce in the district, taken occasionally and very sparingly in only one pool, viz. crater 'A.'
- Glaenocoris propinqua* (Fieb.). The occurrence of this very characteristic species was peculiar. It was taken two or three times during October, 1942, in the moorland crater 'C' and in a nearby small *Sphagnum* pool, but has not been observed since. This is the only Yorkshire locality recorded. The specimens belonged to the pale form of what is more generally known as *G. cavifrons* Thoms.
- Micronecta poweri* (D. & S.). Occasionally very abundant in a backwater of Mill Beck, but not seen elsewhere.

#### NOTONECTIDAE

- Notonecta glauca* L. Common and widely distributed, but less common in moorland pools.
- N. obliqua* Gall. The most plentiful species in this locality, usually associated with *N. glauca*. An undescribed mutation (which requires further attention) occurs in a detritus pool on the cliffs.
- N. maculata* Fab. has occurred once only, in crater 'A' on pasture land. This is the only Yorkshire record, and apart from a Cumberland record, represents the most northerly British locality.

#### NEPIDAE

- Nepa cinerea* L. Recorded once only, in sediment of a detritus pool on the cliffs.

#### VELIIDAE

- Velia currens* (Fabr.) very common and plentiful, both on small pools of standing water, but especially on backwaters of streams.

#### GERRIDAE

- Gerris costae* (H-S). Not at all common in the district, and only found on moorland pools, such as Mossy Mere (altitude 700 ft.).
- G. thoracicus* Schum. Not very common and not seen on moorland pools, but occurring on both standing and running waters.
- G. gibbifer* Schum. The commonest and most plentiful species in the area, occurring in most types of habitat, but especially plentiful on detritus pools.
- G. lacustris* (L.) on standing water mainly, but not very common.

#### SALDIDAE

- Saldula saltatoria* (L.) the commonest species and frequently plentiful about the damp margins of pools and streams. It has even occurred in the damp region around the bird bath in the garden.
- S. c-album* (Fieb.) less common, but in similar habitats.
- Chartoscirta cincta* (H-S) taken once only in the boggy region bordering a stream on the cliffs.



## ENTOMYCOLOGY

Chairman's Address to Mycological Section of the Yorkshire Naturalists' Union at Sandsend, September, 14th, 1946.

W. D. HINCKS, M.P.S., F.R.E.S.

IN the early days of Natural Science the different branches of the subject were not uncommonly regarded as absolutely apart and distinct; the devotee of one branch evincing no interest whatsoever in matters pertaining to the others. Time, experience, and the biological advances of the last century removed the barriers between the different departments of Natural History, but human infiltration from one domain to another has lagged behind. Increasing interest in the ecological aspects of biology and the development of a new approach to the basic subject of systematics are bringing, at last, workers on divers subjects to a recognition of their interdependence one upon the other and of the marked overlap that exists between branches formally regarded as irrevocably and completely separate.

Elton, in his book, *Animal Ecology* (1927, p. 35) says "... the division of science into water-tight compartments is to be avoided like the plague. At the same time there are problems in the reactions of animals [and plants] with their environment, which call for a special point of view and a special equipment, and one of the most important of these is a slight knowledge of a number of different subjects, if only a knowledge of whom to ask or where to look up the information that is required."

There has long existed a mutual regard and a sense of commity between the phanerogamic botanist and the entomologist, but similar relations between the mycologist and the entomologist are yet too recent to be graced by the courtesies which now illumine the former association. No doubt many mycologists and entomologists hardly yet realise the vast area of common ground which they share and it is the purpose of the present notes to draw attention, however imperfectly, to a few of the better-known examples of mutual interest.

One would like to see every team of mycologists with at least one entomologist working with them, and conversely, an entomological team cannot be considered complete without the inclusion of a mycologist. In the economic field these two groups are being increasingly thrown together by the nature of their problems and recognition of this trend is gaining ground in professional circles. It is much to be hoped that this tendency will spread to amateurs and Natural History societies, and it is pleasant here to record again the pioneer spirit of the Mycological Section of the Yorkshire Naturalists' Union who have given their most coveted honour of chairmanship to an entomologist for a season. He hereby returns his sincere thanks and appreciation with the hope that he has merited the honour and sustained creditably the fine traditions upon which amateur mycology is based and from which it draws its abundant vitality.

In 1858, George Robert Gray, an entomologist, took a pioneer excursion into 'entomycology,' when he privately published a quarto paper of 23 pages and six plates, entitled, *Notices of Insects that are known to form the Bases of Fungoid Parasites*. This interesting production is probably rare and I have been fortunate enough to see the copy belonging to the Royal Entomological Society of London. It is little more than an annotated catalogue of the few instances of insects attacked by fungi recorded in the literature of the period. However, it is an interesting and useful starting point for historical considerations which are not, however, within the scope of the present paper.

### FUNGICOLOUS INSECTS.

A surprisingly large number of insects of divers orders are fungus feeders. Principally, however, fungicoles occur most frequently in the large orders, Coleoptera or Beetles and Diptera or Flies. Of the former, some twenty families are associated in part or entirely with fungi, the relationship varying from primary in the case of direct fungus feeders such as the Ciidae, to secondary in the case of many Staphylinidae or Rove Beetles, which exist as predators on fly larvae and mites, etc., through symbiotic associations like those of the Ambrosia Beetles and their fungi. Donisthorpe (1935) has already contributed a list of the British fungus beetles and their hosts, which is incomplete, however, omitting, for instance, the little Mycetophagid *Litargus connexus* (Geoffr.), which occurs commonly in the Pyrenomycete *Daldinia concentrica* (Bolt.). It is interesting to note that a number of the beetle pests of stored products which have required so much urgent research

of recent years, are actually fungicoles and not feeders on cereals and other stored goods. Their control, therefore, becomes the concern of both the entomologist and the mycologist.

Primary fungicolous beetles are rarely to be found far from their host fungus except occasionally in the adult stage. All the developmental stages are passed in the fungus. Symbiotic relationships between fungus and insect occur very frequently and have an important bearing on plant pathology, as will be seen later. In the beetles an interesting relationship of this kind is that which exists in the case of the Ambrosia Beetles. These are members of the Bark-beetle family, Scolytidae, but instead of living in bark they tunnel the wood. We have seven different species of Ambrosia Beetles in this country and at least one, *Trypodendron domesticum* (L.), is common enough in Yorkshire. The life-histories of the British forms have not been adequately worked out in this country and we are thus dependant on information supplied by American and Continental authors. The galleries of these beetles are always stained by a characteristic fungus having masses of white spores which are the food of the beetle larvae. When the new generation of adult beetles emerge and move to their new homes they carry spores of the fungus with them so that it becomes established in the galleries which they in turn excavate. It is interesting to note that the spores fail to germinate if artificially transferred and do so only when they have been carried by the beetle. The systematics of the fungi seem to be little known, but it has been stated that they include several species of *Monilia*, a composite genus of Hyphomycetes.

Turning to the Diptera or Flies, several families are entirely or mainly mycophagous. The fungus flies *par excellence* are the *Fungivoridae* (*Mycetophilidae*) or Fungus Gnats, of which we have 477 different species in Britain alone. Not all of these are fungus feeders, but many are amongst our commonest and most universal fungicoles. The British species have been twice revised by Dr. F. W. Edwards (1913, 1924) and in the second paper are included many references to the fungal hosts from which the species have been bred. As would be expected, most of these hosts are Agaricales, the fleshy pileus of which, together with their larger size, offer a suitable pabulum for the numerous gnat brood. These larvae are easily reared, in many cases by the simple procedure of confining portions of the infected fungus in a tin containing a layer of soil to absorb the fluid of deliquescence and to provide a suitable pupal medium. Fungus gnat larvae are often parasitised by Hymenoptera of the family Braconidae, which are thus secondary fungus insects, as are the hosts of Rove Beetles, which prey upon the larvae. The vast numbers of these Rove Beetles is a thing that must be seen to be believed and a large plant of *Polyporus squamosus*, beaten over a white sheet will often produce swarms of these beetles.

The dipterous family *Itonididae* or *Cecidomyiidae*, members of which are usually known as Gall Midges, also contains a number of fungicoles, several of which are serious pests to mushroom growers. These have been ably discussed recently by Barnes (1946), whilst reference to a general paper on mushroom insects by Austin (1933-37) may also be made.

The symbiotic relationship between the Stinkhorn (*Phallus impudicus* (L.)) and blowflies is so well known that further mention of it need not be made here.

Abroad, fungi form the food of two interesting groups of insects, certain species of the Isoptera or Termites and some of the Ants (Hymenoptera, Formicoidea). The simple facts have been known for many years but the details are still insufficiently examined. Termites in widely scattered localities are known to cultivate fungi in special chambers in their nests or termitaria. Fungal spores are ingested by the workers and grown on the excreta of the insects. Only the young and royal castes feed on the fungus, which is, therefore, literally 'royal fare.' Our knowledge of the different species of fungi cultivated is lamentably deficient. Fructifications of *Xylaria* and *Volvaria* have been found associated with termitaria. Hendee, quoted by Leach (1940) isolated 33 known genera and 20 non-sporulating cultures from Termites, including species of *Pericillium* and *Trichoderma*, but it is not clear whether any of these are specifically associated with the termites.

It is said that more than a hundred different species of ants are known to cultivate fungi. Each group or species is thought to cultivate a different species of fungus. Specially made beds of plant fragments are prepared in the underground nests of the insects on which the fungi are cultivated. Apparently no spores are formed, but what are known as 'bromatia' develop at the hyphal tips. These

form the food of the ants. Again the identities of the fungi are problematical, although various Agarics and *Xylaria* have been recorded as present in the fungus gardens. An associated agaric *Rozites gongylophora* was described by Möller in 1893. In 1899 Spegazzini named a stroma as *Xylaria micrura*. More recently *Lentinus atticolus* has been recorded by Weber and a yeast-like *Tyridiomyces formicarum*, probably incorrectly placed in the Exoascaceae. Wheeler, in his classical book, *Ants* (1913) devoted a long and interesting chapter to the fungus-growing ants. The same author's masterly *Ants of the Belgian Congo* also contains data on the fungus-growers (p. 375-384) followed by a valuable catalogue with illustrations, of the fungoid parasites of ants (p. 384-401). When these ants and termites migrate they are known to carry spores of the fungus with them and thus to establish new fungus gardens. Dade has shown that in a similar manner transmission of the Mealy-pod disease of Cocoa, the Phycomycetous *Trachysphaera fructigena*, takes place in the Gold Coast.

We can now leave the vast subject of insects which feed on fungi with these few illustrations, noting in passing that mycologists have not perhaps developed this aspect of entomycology as vigorously as might be expected.

#### ENTOMOPHAGOUS FUNGI.

In this branch of our subject, that dealing with the fungi that feed on insects, mycologists have contributed very fully. Much is owed to the lifelong labours of Petch, happily still working on mycology, whose contribution has been the major one. It is pleasant to recall at this time that Mr. Petch was formally a President of the Yorkshire Naturalists' Union and that some of his work has been done in the county in association with this committee.

Rather large numbers of fungi have been recorded as attacking insects. The majority belong to the Ascomycetes, Phycomycetes and the Fungi Imperfecti. The genus *Cordyceps* is one of the best-known groups of Ascomycetes causing several important diseases of insects. The entire body of the unfortunate host becomes penetrated by the mycelium of the fungus and on the outside hyphae and conidia form. The latter vary in form in the different species and may be of the *Penicillium*, *Verticillium* or *Isaria* type. A sclerotium develops within the insect from the mycelium and eventually produces the well-known elongate stroma, which carries the perithecia from which the ascospores are developed.

The interesting Laboulbeniales are also Ascomycetes. These are obligate non-fatal parasites of insects and do not cause any injury to the host. The various species tend to form velvety patches on specific parts of the hosts. Their attachment is superficial and does not penetrate the integument. This group apparently has received little attention from mycologists in this country. Entomologists have recently recorded the occurrence of *Laboulbenia gyridarum* Thaxter in Sussex on one of the Whirligig Beetles (*Gyrinidae*). In a recent interesting paper, Donisthorpe (1942) summarises the known occurrence of Laboulbeniaceae on ants.

*Septobasidium* is a large genus of fungi belonging to the Tremellales. The species are invariably associated with Scale insects or Coccids, the fungus and the insects living symbiotically. The resupinate fungus overlies the scale insect colony which lives amongst its folds. The fungus thus serves to protect these defenceless insects and at the same time draws sustenance by penetrating the bodies of some of the hosts. The fungi are spread solely by the migrations of the young Coccids. Instances of symbiosis between fungi and insects are numerous and tend to underline further the need for a similar relationship between the mycologists and the entomologists.

The Phycomycetes include the well-known Entomophthorales, all of which are restricted to insect hosts. The common *Empusa muscae* Cohn, is familiar to everyone. It attacks flies of many species which are frequently seen, especially in autumn, fixed to the tips of grasses, their bodies distended by the fungus. Many of the epidemic diseases amongst insects caused by fungi have been little studied. Some, however, are relatively well known, as is the case of *Empusa grylli* Fr., which attacks grasshoppers and locusts. This species is discussed by Uvarov (1928), based on the researches of Skaife. The fungus appears to be very widespread and is responsible for epidemics to grasshoppers in North America, Europe and South Africa. On the other hand the *Empusa* is restricted to certain grasshoppers only and, for instance, never affects the migratory locust, *Locusta migratoria* (L.). Grasshoppers affected by the fungus climb to the extreme tips of shrubs and plants,



dying with their heads directed upward and the anterior legs embracing the plant. Shortly after death masses of clavate conidiophores appear on the insect, resembling patches of down. The conidiophore stem appears to become turgid after a time, separating the oval conidium at the septum with sufficient force to increase the chance of it falling on an unaffected insect to which it adheres. If climatic conditions are suitable the conidium germinates by penetrating the body of the insect. It is thought that conidia which do not immediately touch another insect can germinate under suitable conditions to produce secondary conidia, which again have the chance of attaching themselves to a suitable host. It may be added that it has been found impossible to culture this fungus on artificial media. *Empusa grylli* is known to occur in Britain and has been recorded by Petch (1939, *Trans. Brit. Myc. Soc.* 23, 129) from Allertorpe Common.

Turning to the Fungi Imperfecti we may cite *Fusarium* (*Lachnidium*) *acridiorum* Giard, another locust parasite, which, together with *Isaria stenobothri* Holl. & Mor. is mentioned by Uvarov. In connection with the latter the position may be gauged by Uvarov's statement 'Hollande and Moreau refer the fungus to the genus *Isaria* (which is mainly a dumping-place for less-known forms) and call it *Isaria stenobothri* Holl. & Mor., but Grassé is inclined to think that the fungus is related to the Ascomycetes and belongs to an undescribed genus.'

In wet chilly weather there is a heavy mortality of the nymphs of the common earwig (*Forficula auricularia* L.) due to *Empusa forficulae* (Giard) Petch. The same host is attacked by the green muscardine fungus *Metarrhizium anisopliae* (Metsch.) Sorokin, which appears to have a wide range of insect hosts. For instance, it is recorded from the larvae of the weevil *Curculio elaphas* Gyll., attacking chestnuts and acorns in Italy. The common earwig is also said to be attacked by *Oospora destructor* (Metsch.) Delacroix, which is also reported as killing such diverse insects as cutworms.

The well-known pest of stored products, the Tobacco Beetle (*Stegobium paniceum* L.) has a symbiotic yeast associated with it. This is *Saccharomyces anobii* Buchner, and it occurs in the intestinal tract enabling the beetle to digest its incredibly varied food materials. It is interesting that the fungus is transmitted by the eggs becoming contaminated at the time of laying.

#### INSECTS AS DISSEMINATORS OF FUNGI.

The close association between many insects and fungi is so widespread a phenomenon that one is quickly brought to the subject of insect vectors of fungoid diseases of plants. Of this subject, much is already known due to the labours of both mycologists and entomologists. It is also true that much more remains to be discovered by their mutual efforts.

In considering this aspect of plant pathology Dutch Elm disease (*Ceratostomella* or *Ophiostoma ulmi* Buism.) leaps to the mind at once. The vectors of this destructive fungus are several species of Bark Beetles (*Scolytidae*), principally *Scolytus scolytus* (F.) and *S. multistriatus* (Msh.). It has been found that the beetles are almost invariably contaminated with the spores of the fungus and when they migrate to healthy trees their feeding causes the pathogens to be inoculated into the new host. Another well-known disease carried by Bark Beetles is the Blue Stain of Norway Pine (*Ceratostomella* or *Ophiostoma ips* Rumb.) and the so-called Perennial Canker of our apple trees (*Gloeosporium perennans* Zeller) is said to owe its perennial nature to the Woolly Aphis, *Eriosoma lanigerum* (Haus.) which re-infects the tree annually. Other familiar plant diseases transmitted by insects are Black Leg of Cabbage, *Phoma lingam* (Tode ex Fr.) Desm. probably carried by wireworms and cutworms, and Ergot of cereals and grasses, *Claviceps purpurea* (Fr.) Tul. for the transmission of which flies and even bees are responsible.

A few less familiar instances may perhaps also be quoted. One of the most serious diseases of cotton is called Internal Boll Rot (*Nematospora gossypii*). Transmission of this disease is caused by the feeding of plant bugs of the genus *Dysdercus*, and the type of infection is known as 'stigmatomycosis.' The New Zealand Anthribid beetle, *Doticus pestilans* Olliff, lives in and feeds upon a rust fungus gall, *Uromycladium notabile*, which it no doubt spreads, on the gum tree *Acacia decurrens*. When by chance the acacias occur near apple trees there is a tendency for some of the beetles to migrate to these trees, where they may occasion serious damage. In New York State hops are said to be heavily attacked sometimes by the aphid *Phorodon pruni* (Scop.) (= *humuli* Schr.) which also occurs in this



country. In feeding this insect produces a copious honeydew on which a sooty mould *Cladosporium aphidis* develops occasioning even greater damage than the green-fly. The hops are also frequently attacked by a downy mildew, *Pseudoperonospora humuli* (Miyabe and Tak.) and a powdery mildew, *Sphaerotheca humuli* (DC.) Burr., but whether these have any connection with the green-fly does not seem to be recorded. The Beech Coccus, *Cryptococcus fagi* (Baer.) is common in Britain. The eggs are deposited in summer and the young sometimes crawl considerable distances before settling. Heavy infestations result in the death of patches of bark and sometimes of the cambium. Such areas where the Coccus have been feeding in large numbers are often invaded by *Nectria coccinea* (Pers.) Fr., which assists in killing the trees or in causing serious damage.

It will be noticed that these few illustrations, which could be multiplied almost indefinitely, exhibit several different relationships between the insect and the pathogenic fungus. In other words the rôle of the insect in plant diseases is not always simply that of carrying the pathogen from an infected to a healthy plant. Even where the pathogen is directly transmitted by the insect vector the effect may not be as direct as in the case of the Dutch elm disease. For instance, the Blossom Blight of Red Clover, *Botrytis anthophila* Bond., which is carried by the bees pollinating the flowers, leaves the vigour of the plants unimpaired, but results in the economically important decreased yield of seed. The complicated relationships between the insect vectors and the pathogenic fungi are so varied and so intimately associated with secondary factors as to render the task of unravelling the details as difficult as it is interesting.

#### FUNGI IN THE BIOLOGICAL CONTROL OF INSECTS.

It is not surprising that advantage has been taken of the fact that many insects are subject to serious fungal epidemics in order to control the depredations of pest species. Accounts of the results of control measures using fungi contain many conflicting statements and it can hardly be said that these methods are an unqualified success. Pioneer work on the use of fungi for this purpose dates back to Metchnikoff, who studied the problem during the last century. He was followed by other Russian workers, notably Cienkowsky and Krassiltschik. Since that period many workers have been attracted to this apparently promising field of research.

In early experiments on grasshopper control the fungus *Empusa grylli*, already briefly mentioned, was cultured and distributed in South Africa to farmers and others interested. At first it was considered that the results were good, but it was ultimately discovered that the cultures actually contained nothing but *Mucor* spp., which of course gave purely negative results, the apparent success of the initial experiments probably being due to natural epidemics of the *Empusa*. The fungus cannot be cultured except on living media and the future of this form of control depends on overcoming this difficulty.

In Florida, Citrus White Flies (*Dialeurodes* spp.) are controlled by *Aschersonia aleyrodis* Webber, and *A. goldiana* Sacc. & Ellis. Suspensions of the spores of these fungi or leaves carrying infected insects are distributed to orchards, it is claimed, with marked success. Somewhat similar attempts have been made in the United States to control the Apple Sucker *Chermes* (*Psylla*) *mali* Schm., by means of the fungus *Entomophthora sphaerosperma*. It is reported that many experiments have proved successful in the control of green-fly in Porto Rico by means of the fungus *Acrostagmus aphidum* Oud. Suspensions of spores were obtained from cultures and from dead aphids and these were sprayed on the infested plants.

Many of the best-known entomophagous fungi used as controls attack a wide range of hosts, often belonging to several different orders of insects. Thus *Botrytis* spp. are recorded as attacking Lepidoptera, Coleoptera, Diptera, and Arachnida. *Cordyceps* is recorded from Lepidoptera, Coleoptera, Homoptera, Diptera, Hymenoptera and Orthoptera. Such genera as *Aspergillus*, *Beauveria*, *Empusa*, *Entomophthora*, *Metarrhizium*, *Penicillium* and *Sporotrichum* are also widely known as causing diseases in insects of three or more different orders. Important fungi which attack various destructive scale insects are *Sphaerostilbe aurantiicola* and *Podonectria coccicola*. The usual method of propagation practiced appears to be simply that of suspending pieces of the material carrying the fungus on the infested plants. It has been suggested in the case of the Vine moths attacked in France by *Spicaria farinosa*, that mortality was highest where hymenopterous parasites were most plentiful and that these beneficial insects carried the spores which served to infect

the caterpillars. *Metarrhizium anisopliae* has been used to control the European Corn-borer, *Pyrausta nubilalis* (Hueb.) and good results were obtained by dusting or spraying with dilutions of conidia in inert substances such as flour.

It is evident that the use of fungi to control insect pests is still in the experimental stage and it would appear to be another aspect of entomycology where close co-operation between the entomologist and the mycologist is necessary for satisfactory progress to be made.

In attempting to sketch in the few minutes available to me, something of the vast territory of entomycology, the picture presented can convey little more than fragmentary impressions. Perhaps sufficient has been said, however, to underline the existence of a field of investigation which can only be adequately explored by the co-operative efforts of both the mycologist and the entomologist. That such a bifocal view, so to speak, would prove fruitful there can be no doubt whatsoever and results should accrue of the greatest value to pure as well as applied mycology.

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#### THE EDIBILITY OF HYDRACARINA

CAPT. J. L. CLOUDSLEY-THOMPSON, B.A., F.Z.S.

THERE are over 200 British species of water-mites, which vary greatly in form and colour [4, 13, 20, 21, 22, 23]. In many cases the animals are brilliant scarlet (Hygrobatidae) and against green water plants, conspicuous as the berries on holly. The Limnocaridae, although usually some shade of green or blue, are far from being cryptic in appearance. They are certainly far more conspicuous than the pinkish Cladocera and Copepoda, which are important fish foods, and their colour is largely due to pigment deposited in the epidermal cells, and not to oil globules showing through a transparent cuticle. In some species the skin is soft, others possess chitinous plates, which may form a complete armour. Glands occur, scattered over the surface. When three red mites were placed in a tank containing a number of 'Millions Fish' (*Lebistes reticulatus*) which show a degree of selectivity in the choice of food [6], they were violently attacked, the fish attempting to devour them. The mites, quite unharmed, were forcibly ejected on being bitten [7]. This observation led me to wonder whether the conspicuous coloration might not have a warning function and experiments have been made with a number of different predators to determine if this is so.

A red mite was placed in a dish containing ten elvers of the common Eel (*Anguilla anguilla*), which had been kept without food for a couple of days, but no attempt was made to eat it. The mite was then crushed, and although the corpse was bitten by

no less than seven of the elvers, it was invariably ejected. Small pieces of worm and a number of Daphnia, however, were immediately swallowed. Young trout (*Salmo trutta*) and a small Pike (*Esox lucius*) ignored Hydrachnids completely, but an adult Stickleback (*Gasterosteus aculeatus*) and Newt (*Molge vulgaris*) ate them with alacrity. The mites were ignored by larval newts as well as by the centipede *Lithobius forficatus*, in which food is detected by the sense of touch alone [5]. Mites placed in a small beaker containing Dragon-fly nymphs (*Platetrum depressum*) and Water-boatmen (*Notonecta glauca*) were killed overnight, but not eaten; and two individuals placed in a jar with several specimens of both *Hydra fusca* and *H. viridis* were quite unharmed, although the *Hydra* soon contracted and died within a few days: the mites were still alive after two months. On tasting a water-mite, no particularly unpleasant flavour was noticed. The species used in these experiments were *Hydrarachna schneideri* Koch and *Limnesia maculata* (Müll) for the identification of which my thanks are due to Mr. E. Browning of the British Museum (Natural History).

Like many aposematic animals, Hydracarina are extremely tough and resistant. They are able to survive immersion in 50 per cent. alcohol for several hours [10]. I remember 'fixing' one in Osmic acid for five minutes; it was then placed in 30 per cent., 50 per cent., and 75 per cent. alcohol. After three minutes in the last it began to move its legs again.

Animals tested in aquaria are by no means in a normal environment, so that results must be interpreted with care. A study of the literature, however, provides an indication of the extent to which Hydracarina are eaten in nature. In an investigation of the ecology of the nymphs of British Plecoptera, it was found that only two of the species examined had eaten Hydrachnida (*Perla carlukiana* 2 per cent., and *Dictyopterygella bicaudata* 5 per cent.). In each of these species there was an indication that 'no great selection of foodstuffs occurs; anything available being eaten' [11]. I am unable to trace any records of Hydrachnids being eaten by aquatic Hemiptera, Coleoptera, or Odonata nymphs.

The Brown Trout (*Salmo trutta*) was found to have eaten no Acarina in an area where they formed 2 per cent. of the total invertebrate species [16]. A specimen has twice been reported from the stomach of the adult Salmon (*Salmo salar*) [14]: they are eaten to some extent by first year, but not at all by second year fish [3]. In the Hampshire Grayling (*Thymallus thymallus*) mites were found in the stomach contents to the extent of 4.4 per cent., but were absent from the Derbyshire Grayling: three were found in 50 stomachs of the Flounder (*Platichthys flexus*), and comprised 6 per cent. of the species in those stomachs; while they formed 0.03 per cent. of the total fauna of the environment. Remains of Hydrachnids were found in the stomach of the Roach (*Rutilus rutilus*), but not in the Gudgeon (*Gobio gobio*) [19].

Hydracarina, which are typically weed dwellers, were found to provide 10 per cent. of the food of the Skelly (*Salvelinus alpinus* Lonsdalei), but only 2 per cent. of that of the Char (*Coregonus clupeoides stigmaticus*) hence the former were assumed to feed nearer the bottom. Mites also provide 2 per cent. of the food of small Trout, but are not eaten by the Perch (*Perca fluviatilis*) although crustacea of a similar size are taken in large quantities [24]. Hydrachnida and Rotifera comprise 8 per cent. of the diet of the Minnow (*Phoxinus phoxinus*) [8], but are apparently absent from the food of Eels (*Anguilla anguilla*) [9].

McAttee records 535 water-mites in the gizzard of a Green-winged Teal, 594 of the same group in the stomach of a Pied-billed Grebe, and claims that practically all frogs, toads, and salamanders that have been studied have not neglected mites in their diet. [12]. Although his figures show a percentage of identifications among those of all Arachnida of 2.3681, the percentage of species in this order among all Nearctic Arachnida was 23.0886. Special reference is made to the conspicuousness of Hydracarina on account of their activity and the brilliance of their colouring by Wolcott [25], who adds that examination of the contents of fish stomachs indicate that mites may comprise a considerable proportion of the food of fishes. 'They seem to go to pieces very quickly and so are rarely reported in any numbers in the results of such examinations.' No figures are given, however, in support of these statements.

Major P. H. T. Hartley has kindly supplied me with a summary of his notes on the extent to which Hydracarina are eaten by fishes. Of 2,251 Roach (*Rutilus rutilus*) examined, only one fish was found containing Limnocarid, and two Hygrobatid mites. One specimen of the Bream (*Abramis brama*) contained Limnocarid



mites, two Hygrobatid, and one unidentified mites out of a total of 1,226 fishes. One out of 115 White Bream (*Blicca bjorkna*) contained Hygrobatid mites and of 129 Minnow (*Phoxinus phoxinus*) one contained Hygrobatid and three unidentified mites. Unidentified mites were also found in the stomach of one Stickleback (*Gasterosteus aculeatus*) out of 227 fishes investigated. No Hydracarina were found in the stomach contents of 263 Rudd (*Scardinius erythrophthalmus*), 238 Dace (*Leuciscus leuciscus*), 480 Gudgeon (*Gobio gobio*), 204 Perch (*Perca fluviatilis*), 211 Ruffe (*Acerina cernua*), 30 Brown Trout (*Salmo trutta*) and 122 Eels (*Anguilla anguilla*).

It is probable that fish are well able to distinguish the colour red, since it is commonly found amongst these animals, for example, in the male Stickleback during the breeding season. Brilliant red 'flies' are, I understand, greatly favoured by anglers, and it has even been suggested that insects heavily parasitized by Acarina are particularly favoured by Trout. In view of the lack of selectivity exhibited by these fishes, however, this appears scarcely likely.

It is quite possible that the presence of mites in the stomach contents of many aquatic carnivores may be due to the fact that they happened to be parasitic on other prey and were thus eaten fortuitously. The protection from environmental factors afforded by vegetation appears to be the main factor influencing the number of mites in a given locality [15, 17, 18]. If the conspicuous coloration has indeed a sematic function, it is significant that Hydracarina are seldom found in dark muddy waters [7, 20]. The basis of the water-mite's behaviour is a random locomotory activity in search of food (crustacea and aquatic insects) which is detected by touch. A simple action system based on the principle of trial and error seems to be correlated with the simple mode of life [1, 2].

I have recently noticed the interesting observation of F. S. Bristowe (1940, *The Comity of Spiders*, Vol. 2. Ray. Soc. Publ., 128) that mites are seldom eaten by spiders. The majority are distasteful, and are ejected after one touch. The figures of McAtee quoted above are misleading for reasons outlined by H. B. Cott. (1935, *Proc. R. Ent. Soc. Lond.*, 9, 31, 109) and others.

In conclusion, therefore, it is suggested that the bright colours of Hydracarina may have a sematic function and be correlated with unpalatability if not distastefulness to predators. At the same time it is evident that conspicuousness is in no way disadvantageous to the group as regards escape from enemies.

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## ORNITHOLOGICAL REPORT FOR NORTHUMBERLAND AND DURHAM FOR 1946

Compiled from the records of members of the Ornithological Section of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne and other observers, by GEORGE W. TEMPERLEY, M.B.O.U.

(A key to the initials appearing in this Report will be found at the end of these notes. Abbreviations: N = Northumberland; D = Durham; B.B. = *British Birds*.)

The use of the numbers with the English names employed in Witherby's *Handbook of British Birds* has been adopted to save the space of printing the scientific names.

Where reports of rare birds are placed in square brackets it is implied that, being sight records only, some slight element of doubt exists as to the accuracy of the identification. Such reports are included for the information and guidance of other observers, who should in future be on the look out for the species.

The number of observers contributing notes to these reports has now reached a total of 75. Owing to the abridgement of the Report for publication in *The Naturalist*, many interesting notes sent in have had to be omitted, but every note helps the compiler to obtain a more extended view of the bird life of the two counties, on the basis of which this Report is constructed.

It would greatly help the compiler if observers would (1) keep notes for the two counties separate, (2) arrange notes as far as possible in the order in which they appear in this Report, (3) write on one side of the paper only, (4) send in their reports at more frequent intervals, quarterly or even monthly.

The compiler is most grateful to all the contributors, and will gladly welcome notes from new observers. These should be sent to George W. Temperley, Hancock Museum, Newcastle upon Tyne.

Records of outstanding interest this year are the first breeding of the Black-necked Grebe in County Durham and the first record of Sabine's Gull in Northumberland.

In our last Report we referred to the effect that the re-opening of the beaches to the public since the war might have upon the bird life of the coast. During the year we have had several reports showing that the amount of shore-shooting practised, both in and out of the season, has very greatly increased. It is by no means confined to shooting at week-ends or to dusk 'flighting' of wildfowl; every sizable bird which might prove edible has been slaughtered, and species which in the past have been secure, owing to their unpalatability or their small size have now suffered considerably. One of the areas most affected is that at the Tees mouth, where birds have not only been shot but have been systematically robbed of their eggs. It is very satisfactory to find that the birds breeding on the Farne Islands are already showing the benefit of adequate protection; but even there it will probably take several years before pre-war numbers are attained.

**MIGRATION.**—The autumn passage of passerine migrants on the Northumberland coast has been observed and recorded for some years past by more than one generation of ornithologists, and the same is true of the Yorkshire coast; but very little indeed has been recorded from the coast of Durham, with the exception of Teesmouth, from which in years past T. H. Nelson, and later, Joseph Bishop, contributed some valuable reports. One of our contributors, F. G. Grey, has been giving some attention to this matter, and in September-October 1946 observed several species obviously on migration, on and near South Shields Pier. Further observations on these lines should be made in the future, and observers who reside near the Durham coast are asked to pay attention to this aspect of bird watching in future seasons.

### CLASSIFIED NOTES

I. RAVEN.—Reported in the breeding season from Cheviot (per S.E.C.), near Sweethope, N. (W.A.C.), North Tyne (T.F.H.), Moors above Allendale (G.A.), Upper Teesdale (H.W.). One or two pairs may have been allowed to breed, but persecution is known to have taken place in some districts, and it is clear that this fine and harmless bird requires more protection. Ignorance of its habits is probably the reason for its destruction by gamekeepers, shepherds and others (G.W.T.).

2. **HOODED CROW.**—Winter, 1945-46. Few noted; most of the records coming from the coast. Some birds remained longer than usual. Thus on May 31st one was seen at Chiswick, N., and was still there on June 13th (F.B.). On June 15th a couple was seen on the beach between Seahouses and Beadnell, N. (M.G.R.).

Winter, 1946-47: Considerably more reported and over a wider area. The following are the most noteworthy of many records. First seen October 7th at Cullernose Point, N., where at least three remained during the winter (W.S.C.). November 16th, at Budle Bay, 25 birds in company with 30 Carrions (F.B.). October 23rd, at Howick Burn Mouth, at least six with Carrions (F.G.G.). October 6th to December 22nd, one or two usually present at Alnmouth (H.T.). October 8th, one at Blagdon, N. 'Very seldom seen in this district' (M.W.R.). October 9th, one with a Carrion at Hole Row near Shotley Bridge, and other odd birds seen later (E.M.). October 26th, one near Greatham Creek, Teesmouth (O.C.H.).

3. **CARRION CROW.**—A pair nested in the 'Kittiwake Gully' on Staples Island, Farnes. Young were hatched, and a liberal toll of the eggs of the breeding sea-birds had been taken before the nest was discovered (T.R.G.). Early in February a couple of Crows was seen to attack and kill an adult Stoat. The Stoat, a female, was quite white except for the head, part of neck, tail and a portion of the hind legs (J. Stobart, Guards Farm, Prudhoe). On May 5th, at 8-30 p.m., a flock of 70 birds was counted going to roost in woods at Ravensworth, D. (G.D.S.).

4. **ROOK.**—There is more evidence of the increase in the Rook population. At the end of last century a rookery at Craster Tower, N., was destroyed. No attempt was made by the birds to re-establish it until the year 1942, when three nests were built near the old site; in 1943 there were 15 nests, in 1944, twenty, and in 1945, twenty-two (J.M.C.). It is estimated that in September there were from 6,000 to 7,000 birds at the Woolsington winter roost, two-thirds Rooks and the remainder Jackdaws. The Woolsington rookery itself has now fewer nests than formerly. Before the war it was a very large one, but as a roosting haunt it still attracts birds from over a wide area. Another large roost is at Kirkley Hall, about five miles distant (J.A.).

14. **STARLING.**—A winter roosting flock is now using the girders of the Tyne Bridge, Newcastle, in place of the now dismantled staiths at Dunston (J.W.H.). Another roosting site was the coal hoist at Albert Edward Dock (H.T.). A large flock gathers nightly on the Transporter Bridge spanning the Tees between Port Clarence and Middlesbrough (P.L.H.).

18. **HAWFINCH.**—Breeds about Blagdon, N. Two nests were found during May, one 25 ft. high in a yew, the other 10 ft. in a hawthorn (M.W.R.). On July 7th a brood was seen at Longwitton, N. (W.A.C.).

20. **GOLDFINCH.**—Several records of single birds and small flocks, but nearly all during the winter months, October to March. Chiefly in the valleys of Tyne and Derwent; but the largest, a flock of 16, was seen near Middleton-in-Teesdale (H.W.). Summer records: June 1st, a pair at Newbiggin, Upper Teesdale (O.C.H.). July 21st, an adult feeding fledged young (T.F.H.).

21. **SISKIN.**—January 7th, about a dozen with Redpolls at Black Bridge, Warkworth, N. (A.E.G.)—the only record for the winter of 1945-46. None reported yet for the present winter.

23. **MEALY REDPOLL.**—The flock reported in December, 1945, as haunting linseed stubble at Hole Row Farm, N., near Shotley Bridge, remained throughout the winter; but none returned in the winter of 1946 (E.M.). December 25th, one seen with some 20 Lesser Redpolls near Anick, Hexham. Larger size, greyer plumage and brighter crimson crown distinguished it from the Lesser Redpolls (H.T.).

36. **CROSSBILL.**—On February 19th a hen was seen in Dipton Wood, N., close to the site of last year's nest; but it was not seen again; nor were any other birds seen in the woods during the year (T.F.H. and A.J.C.). April 19th, one seen near Langley, Haydon Bridge, N. (W.A.C.). July 6th, a pair was seen at Ettersgill, near High Force, Upper Teesdale, D. (S. Hildreth, per J.B.N.). In the Middleton-in-Teesdale district no birds were seen during the breeding season, though single birds were noted on October 27th and 30th, and on November 2nd (H.W.). These are the only records sent in during the year.

42. **BRAMBLING.**—Few were reported in the autumn of 1946, but the crop of beech-mast was ample, and after the turn of the year, large flocks were seen in many places (T.F.H., H.W., etc.).

59. SNOW-BUNTING.—Very few reported during the winter of 1945-46. On January 6th, ten were seen on sandhills near Teesmouth (R.D.S.). On February 9th, one on Holy Island, and on February 23rd, five at Budle Bay, N. (F.B.). March 27th, a cock in summer plumage was seen at Craster, N. (J.M.C.). In the following winter, on November 3rd, four were seen on stubble near Marsden, D. (F.G.G.), and on the 10th, two or three cocks were noted with Linnets at Cheswick (F.B.). In early December there was a flock of ten near Seaton Carew, D. (T.F.H.). The only inland record was a small flock seen in the early winter on the fells between Weardale and Teesdale (per H.W.).

81. ROCK PIPIT.—At Holy Island, on November 2nd, one, out of a party of eight, persisted in wading in pools up to its belly. Usually it picked insects off the surface of the water, but once or twice immersed its head as though reaching to the bottom of the pool (F.B.).

88. YELLOW WAGTAIL.—On migration: April 28th, a large flock on marshes at Teesmouth (T.S.S.). September 15th, two on seaweed at Whitburn Steel, D. (F.G.G.). September 17th, six on River Don near Jarrow (F.G.G.).

90. PIED WAGTAIL.—October 6th, a flock of 75/80 on telegraph wires near Hexham Station (R.G. and E.M.L.).

91. WHITE WAGTAIL.—April 7th, a cock near Cullernose Point, N. (H.T. and T.F.H.). April 24th, five at Hebburn, D., in company with one Yellow and one Pied, one remaining until the 30th (J.R.C.). April 24th, one on the Don near Jarrow (J.R.C.). April 26th, one on a flooded field in N.E. Durham (F.G.G.). One at same place on April 28th (J.R.C.). April 29th, 23 counted, chiefly cocks, in company with five Pied and four Yellow on a muddy area near the Teesmouth (J.R.C.). It will be noted that, with one exception, all these occurred within one week—April 24th to 30th. None reported in autumn.

96. BRITISH NUTHATCH.—During February a flock of 12 or 14 birds was seen at Hamsterley, D., and in early March another of six or seven birds at Black Banks, Wolsingham, D. (M.F.A.).

107. BRITISH MARSH-TIT.—F. B. writes from Berwick: 'During two years here I have kept a special look-out for Willow and Marsh-Tits. None of the former has been found within a radius of eight or nine miles from Berwick; but the following Marsh-Tits were definitely identified: Northumberland—Horncliffe, about five miles up river from Berwick, one on March 11th, 1945, one May 6th, 1946; Swinhoe, two miles N.W. of Belford, one October 12th, 1946. Berwickshire—Newton Mill, on Whiteadder, five miles from Berwick, one July 14th, 1945; Hutton, 1½ miles E. of junction of Rivers Whiteadder and Blackadder, one September 1st, 1945.'

108. BRITISH WILLOW-TIT. Reference in 'Report for 1945' to 'Hurworth Burn' should read 'Hurworth Moor, near Darlington' (J.B.N.). Gosforth Park, N., 'seen on nearly every visit' (M. and C.), pair bred in hole near the top of a 16 ft. ash stump (S. and J.S.A.). Seen at Prestwick Car, N., in July, September and December (M. and C.). About Blagdon, N., Willow and Marsh-Tits are about equally numerous (M.W.R.).

120. WAXWING.—No birds were reported in the autumn of 1945, but after the turn of the year a few were recorded. January 16th, two flocks of four birds each near Stocksfield, N. (G.W.T.); 20th, six at Swalwell Farms, D., and 24th, two in a Swalwell garden, D. (L.P.H.); 27th, one at Alnwick (H.T.).

The largest and most extended 'invasion' for many years occurred in the winter of 1946-47, when flocks were reported from many parts of Scotland and from most of the English counties. In Northumberland and Durham flocks were widespread. The following records, taken from the very large number received, will show the time and extent of the invasion. The first birds reported were four seen at Beadnell, N., on November 2nd (S. and J.S.A.). On the 9th, 40 were seen near Berwick (F.B.), and four at Crookfoot, D. (per P.L.H.). On the 10th a dozen appeared at their favourite haunt of past years at High Horse Close near Rowlands Gill, D., and the flock gradually increased to 67 by December 7th (C.H.). On the 13th ten were seen near Stocksfield, 'fly-catching on the wing' (G.W.T.). On the 16th flocks of 10, 15 and 60/80 were counted between Berwick and Budle Bay (F.B.). On the 19th, 50 on the Aln at Hawkhill Farm (per J.M.C.). On the 24th, 20 near Corbridge and a number near Fourstones at the same time (T.F.H.). At the end of the month, 20 at Wooler, N. On December 3rd six visited Eldon Place in the centre of Newcastle (J.A.M.). On the 7th 30/40, increasing to 60, visited



gardens at Swalwell (L.P.H.). On the 8th there were approximately 100 at Dilston (per E.M.L.). Thereafter numbers reported were fewer, but odd birds and small flocks were seen over an even wider area up to the end of the year.

121. SPOTTED FLYCATCHER.—Several observers reported a falling off in numbers this summer.

123. PIED FLYCATCHER.—An increase in the number of this species has been remarked upon by several observers. Increasing in number about Rothbury and Swarland, N. (M.F.A.). At least 30 pairs bred, or attempted to do so, in nesting boxes in one area of Weardale, from which at least 94 young were reared. In the previous year there had been 17 pairs, and the year before only five. This increase was encouraged by an ample supply of nesting-boxes. An increase was noted in the size of the egg-clutches—'I have seen several clutches of eight eggs this year for the first time; hitherto five or six have been usual' (M.F.A.). Commenting on the sudden disappearance of the Pied Flycatcher immediately the young have flown, M.F.A. writes: 'On one day towards the end of June the woods here are literally full of Flycatchers and the next they have vanished for the year.' This species is not usually found breeding near the coast, probably because suitable woodlands are lacking; but it nests about Guyzance and in River Woods, Warkworth, N. (A.E.G.).

129. CHIFFCHAFF.—An uncommon and local species in Northumberland. Only heard once in six years at Guyzance, N. (A.E.G.). In May one was heard at Blagdon, N., where it is seldom seen and is not known to remain to breed (M.W.R.). From April 20th to July 4th one was seen and heard near Hexham and another on May 26th and 28th near Beaufront, Hexham (R.G.).

173. FIELDFARE.—Many remained late into the spring. May 20th, 17 near Warkworth (A.E.G.). May 21st, four at Lamesley, Team Valley (G.D.S.). June 1st, one on Holy Island (F.B.). Very numerous in the autumn.

178. REDWING.—Very numerous in the autumn. On November 9th a flock of 300 seen at Lowick, N. (F.B.).

187. GREENLAND WHEATEAR.—April 26th and 29th, one on Boldon Flats, D. (F.G.G.). May 23rd, a cock at Cheswick, N. 'Differed from British form in larger size and much brighter plumage' (F.B.).

197. WHINCHAT.—A pair bred in Gosforth Park, N. (S. and J.S.A.).

198. BRITISH STONECHAT.—'At one time comparatively common along the shore near Howick; now seldom seen' (W.S.C.). 'A pair or two always bred on Warkworth golf course and bents; but none has bred this year or last between Amble and Alnmouth' (A.E.G.). Middleton-in-Teesdale—'I have never seen a Stonechat in Teesdale in my life, though I have heard of it being seen occasionally as a passing migrant' (H.W.).

202. BLACK REDSTART.—From March 16th to 20th a hen bird was seen on the cliffs at South Shields at the exact spot and using the same perches as the bird reported in January, 1945 (J.R.C.) (see Report, 1945).

In Hancock's 'Catalogue' (1874) it is recorded that a pair of Black Redstarts nested near Durham City in 1845. This record received scant notice and has been doubted by subsequent ornithologists. Recently the evidence has been reviewed; the nest and an egg, now in the Hancock Museum, have been examined, and the record is now accepted. This was the first, and for a long time the only instance of the breeding of the species in the British Isles. The next occurrence recorded was 78 years later, in 1923 (see G.W.T. in *B.B.*, Vol. XXXIX, p. 110).

225. SWIFT.—On August 31st a migration movement in a north-westerly direction was noted for several hours until dusk in the Team Valley, D. (G.D.S.).

232. HOOPOE.—On May 22nd, Mr. C. Ridley, of Crookhill, Ryton, saw a Hoopoe in the Derwent Valley near Shotley Bridge. He had a good view of the bird and fully described its main features and flight. He is quite familiar with the species, as he has seen it in Egypt and along the coastline of the Western Desert. This is the first Hoopoe to be recorded in the district covered by these Reports for very many years.

249. LITTLE OWL.—Further extensions of its range are proved by the following records: June 21st, one between Slaley and Minsteracres, N. (B.C.P.); September 7th, one on Stagshawbank Common, N. (H.R.O.).

251. SHORT-EARED OWL.—Many observers report birds seen on the moors during the breeding season, proving that there had been no diminution in their numbers; but a shooting party on the moors in Upper Teesdale shot five Short-



reared Owls during the grouse-shooting season! (per H.W.). Several were also reported on the coast as migrants. September 21st, at Holy Island, one seen flying in from the sea, and on the 25th at Berwick, another seen flying in (F.B.). October 6th, at Alnmouth, one flying in, first seen c. 100 yards off shore being mobbed by two Herring Gulls (F.G.G.).

253. **BRITISH TAWNY OWL.**—Unusual nesting site—in a dead stump only 5 ft. high, but surrounded by water, at Seaton Burn, N. (J.R.C.).

259. **PEREGRINE FALCON.**—The Cheviot pair laid eggs, but there is no report as to whether they reared young (per S.E.C.). A few years ago a pair of Peregrines attempted to breed in a crag on one of the tributaries of the North Tyne, previously the nesting site of Ravens, but the keeper destroyed them (W.A.C.). On May 5th this year a sitting hen was flushed twice from this crag, and her mate was also seen (T.F.H.). The Upper Teesdale pair laid two eggs in a crag on the Yorkshire side of the river, but they were taken (H.W.).

263. **KESTREL.**—A young bird ringed at Alwinton, N., on May 27th, 1945, was recovered at Fort William, Inverness, in January, 1946, 150 miles to the N.W. (S. and J.S.A.).

268. **ROUGH-LEGGED BUZZARD.**—On September 7th one was seen on the moors in Upper Weardale not far from where one has been seen in previous years. It was still present on September 26th (R.M.). (See Reports for 1944 and 1945.)

269. **COMMON BUZZARD.**—A pair haunting Upper Teesdale and frequently seen on the Durham side of the river, built two nests in different sites on the Yorkshire side of the river but did not lay in either of them (H.W.). Other Buzzards were reported from Northumberland and Durham, but the species was not definitely ascertained.

289. **HERON.**—At Thropton, N., only one pair bred, but three young were reared (T.G.W.). Two pairs bred in a small plantation on Shipley Moor, W. of Alnwick, N. (H.T.). Two pairs nested at Guyzance, N., but whether they bred successfully is not known. In the previous year one nest had young (A.E.G.). A pair bred on a farm near Acklington, N.; the nest was seen after the young had left (W.A.C.). At Blagdon, N., one pair is reported to have bred successfully this year (M.W.R.). There is a small heronry, not previously reported, in a plantation of spruce and pine near Eastgate in Weardale. In mid-May at least four nests were seen (W.A.C.). The Gainford heronry only contained five nests this year compared with a dozen last year. An adult was found dead of gunshot wounds near the heronry at the end of March (J.B.N.). No records have been received from other known heronries; but the above notes show that many birds are nesting away from the old-established heronries.

On March 16th a Heron with a bright red bill—'quite as bright a red as that of an Oystercatcher'—was seen at a pond near Fawdon, N. (W.E.O.). For notes on this unusual aberration see *B.B.*, Vol. XXXVIII, pp. 149 and 180.

297. **BITTERN.**—A retired gamekeeper at Haydon Bridge reported that on May 15th he saw a Bittern on Humbleton Fell near Langley Castle, N. (per W.J.).

300. **WHOOPEER SWAN.**—Many reported from the Loughs in the winters of 1945-46 and 1946-47, and some also from the coast. Throughout February about 20 were on Holy Island Sands (F.B.). April 18th, one remained for about ten days on Amble Harbour saltings in company with 13 Mutes (A.E.G.). On May 9th, a very late date, an adult was clearly identified on Bolam Lough amongst some 20 Mutes (W.A.C.). The largest flock reported was one of 30 birds on Hallington reservoir on December 26th (R.G., E.M.G. and R.H.O.).

301. **BEWICK'S SWAN.**—Only one reported; January 12th, one flying with two Whoopers near Greenlee Lough (M.G.R.).

303. **GREY LAG-GOOSE.**—Until recently the Grey Lag was only an irregular visitor in small numbers to the Northumbrian coast. In 1912, George Bolam described it as an autumn and spring visitant only and a rare bird on the Borders. In 1932 he wrote that it was 'rarely well identified here in winter,' but added 'the visits of the Grey Lag to the Solway estuary have shown considerable increase during the last two decades, and a similar tendency may be taking place on our coast.' More recent observations have proved that this is so. The Grey Lag is now wintering in Northumberland, as the following records show. In February, 1946, a flock of just under 300 birds was wintering on the coast, mainly feeding on sprouting corn and, when disturbed from the fields, resting on Fenham Flats, N. As late as April 11th, 200 were seen on a farm near Fenham Mill; the last,

12, were seen about April 21st (F.B.). One of the inland haunts of these Geese was near Holborn on the western slopes of the Kylvie hills. A flock of about 50 was seen there on several occasions. In the first week in January two were shot there (H.A.B.). In the following autumn, birds were first observed on October 12th—a flock of 29 at Holborn (F.B.), and a solitary bird was shot on Holy Island slakes (per T.F.H.). On November 2nd a flock of about 140 was counted near Fenham, and 50 more flew in from the north over the Snook of Holy Island (F.B.). Just after the turn of the year, a flock, now numbering over 200, was seen near Holborn (H.T., T.F.H., A.E.G. and G.W.T.), and near Low Moor Point, Fenham, 382 birds were counted, while others, unseen, were heard calling from neighbouring fields (F.B.).

304. WHITE-FRONTED GOOSE.—Another bird was shot near Holborn in the first week in January out of the small party recorded in our Report of 1945 (H.A.B.). None recorded in the winter of 1946-47.

307. PINK-FOOTED GOOSE.—The favourite resting haunt of this species is on Goswick sands, where they have been reported by 'F.B.' and others. During October there were two flocks, of a total number of about 200 birds (T.F.H.).

'Grey Geese,' of unidentified species, have been frequently reported. On March 8th, five parties, estimated at 400 birds in all, were seen flying north across the Derwent valley near Consett (E.M.). On October 2nd a party of 100 or more was seen near the same place, and on November 6th a party of 40, all flying westwards (E.M.).

311. BARNACLE GOOSE.—At the end of September a flock of 40 arrived on Holy Island slakes; 14 were shot and the others left (W.W., per T.F.H.).

312/313. BRENT GOOSE.—At the end of December there were at least 200 on the coast (per T.F.H.), and just after the turn of the year a flock of from 350 to 400 was seen at the South Low (F.B.). Birds examined in the flesh proved to be of both the Pale-breasted and the Dark-breasted forms (G.W.T.).

315. SHELD-DUCK.—About five pairs bred on the Farne Islands (T.R.G.). Common in Beadnell area, where many young were reared (M. and C.). At Teesmouth, at least one pair bred in the rabbit holes where they had established themselves during the war when protected by barbed wire and mines (O.C.H.). Inland, one, immature, was on Grindon Lough from April 4th to 27th (R.G. and E.M.L.).

317. MALLARD.—'A duck was seen, on repeated occasions during hard weather, to dive and swim under water for from 3 to 6 ft. in the River Tyne at Corbridge' (T.F.H.).

318. GADWALL.—March 16th, a single bird on Swinhoe pond, N. (F.B.). On March 28th a drake and two ducks were seen at Seaton Burn, N., and later in the day, this, or an identical trio, was at Brenkley, N. March 30th, one at Brenkley (M. and C.). April 19th, a similar trio at Gosforth Park Lake (J.R.C.). April 29th, three at Brenkley—not seen subsequently (M. and C.). April 8th, a drake at Jarrow (J.R.C.).

319. TEAL.—On May 3rd a Teal was found dead on the moors half a mile east of Allenheads, N., bearing a ring which showed that it had been marked as an adult at the Orielton Decoy, Pembroke, during the previous winter.

322. GARGANEY.—Two pairs again spent the spring and early summer on two flooded areas in N.E. Durham (see Report, 1945). The first pair arrived between April 4th and 8th, when they were first seen (J.R.C.). They were there on the 14th and 15th (F.G.G.), 16th and 18th (J.R.C.). The other pair, on a different pond, was seen on April 27th, 29th and May 1st. The drake was seen on subsequent visits, but the duck only once, when on May 17th it was accompanied by two drakes. Drakes were seen either singly or together until May 31st, after which date no birds were seen (J.R.C. and F.G.G.). No nest was found, nor were ducklings seen at either pond. Comparing this report with that of 1945 the inference seems to be that breeding was being attempted, but was unsuccessful. There is very little shelter and no sanctuary at either pond. Two ducks were on the Teesmouth Marshes on April 6th, and a pair on June 27th (J.R.C.).

323. WIGEON.—Very large flocks recorded off the coast and on inland waters this autumn. On October 12th, 1,500 were counted on Swinhoe pond, N., and 1,000 on Holborn Moss, both sexes and immature birds were well represented (F.B.). By the turn of the year a flock of 300 at Holborn Moss consisted almost entirely of mature drakes (G.W.T. and A.J.C.). At the same time the vast flocks, 4,000 to 5,000, lying off Budle Bay were nearly all drakes (G.W.T.).

Wigeon were observed diving in Bolam Lake, N. *The Handbook* states that this is unusual (M. and C.).

325. PINTAIL.—Single birds were frequently reported during the winter on Gosforth Park Lake (A.M., W.R.L., etc.). A pair was recorded at Grindon Lough as late as April 6th (R.G. and E.M.L.), and another on Cowpen Marsh, D., as late as April 29th (J.R.C.).

326. SHOVELER.—A pair is suspected of having attempted to breed on a flooded field in N.E. Durham. On January 13th seven birds were present; on May 1st one pair still remained. Throughout May one pair, and occasionally two pairs, were seen; but after June 1st none were seen although the pond was frequently visited (F.G.G.). At Teesmouth a pair bred successfully in spite of disturbance (T.S.S.).

328. POCHARD.—Two broods, one of eight and the other of one only, were successfully reared on a flooded brickfield in County Durham (J.R.C. and G.W.T.).

330. TUFTED DUCK.—Eight pairs bred successfully on a flooded brickfield in County Durham. Broods counted were: two of 5, one of 6, one of 7, one of 8, two of 10 and one of 11, making a total of 62 young (J.R.C. and G.W.T.). Twenty to thirty wild birds wintered (1946-47) on the Leazes Park Lake, Newcastle (J.W.H.).

337. COMMON EIDER.—It is estimated that c. 132 pairs bred on the Farne Islands this season. This is an increase on the previous year, but is very few indeed compared with pre-war figures when from 200 to 300 pairs bred on the Inner Farne alone. Owing to molestation during the war years, the ducks were very shy, and some of them deserted their nests after eggs had been laid (T.R.G.). Many observers reported fewer birds than usual off the coast.

340. VELVET SCOTER.—Single birds or groups of two or three were seen off the coast occasionally in January-March and again in August-October (H.T. and others).

342. GOOSANDER.—The Coquetdale pair nested, but the first clutch of eggs was taken. Four eggs were laid later and were probably hatched (T.G.W.). A native of Alwinton, N. is reported to have said that Goosanders were now 'awfu' common bords' and that twenty of their eggs had been taken and eaten hard-boiled (S. and J.S.A.). A pair is now nesting regularly in a hollow tree on one of the tributaries of the North Tyne (W.A.C.). In the winter months birds were reported as unusually plentiful on rivers and loughs; thus, on February 16th, on the Tweed between Berwick and Norham, 25 were counted (F.B.), and on the 24th at least 15 were on Broomlee Lough (F.G.G.).

343. RED-BREASTED MERGANSER.—April 27th, one on Gosforth Park Lake—'The first I have seen there' (A.M.). Can be seen off Warkworth most days in autumn and winter (A.E.G.). On July 12th, an unusual date, a drake and two ducks were seen off Newton-by-the-Sea (K.I.).

344. SMEW.—Few were recorded in the winter of 1945-46, but on February 2nd one was seen on the Till near Weetwood, N. (W. de L.A.), and on May 4th, a late date, a drake was seen on Crookfoot Reservoir, D. (P.L.H.). Several reported in the winter of 1946-47, but all after the turn of the year.

347. SHAG.—The breeding population of the Farnes has continued to increase, and it is estimated that at least 35 pairs bred this year (T.R.G.).

349. GANNET.—On September 17th, at Warkworth, an adult flew in from the sea, where 30/40 were fishing, crossed the golf-course and crashed into telephone wires leading to the North Pier—'I have never seen a Gannet cross the shore before' (A.E.G.).

SHEARWATERS.—Records of Shearwaters off the coast have been more frequent than usual. Reliable identification of the species concerned has not always been possible, but the following may be helpful to future observers.

355. MANX SHEARWATER.—Northumberland. February 9th, one off Snipe Point, Holy Island, probably of this species (F.B.). May 16th, one off Craster. June 3rd, six off Alnmouth (H.T.). June 16th, six in Druridge Bay (A.E.G.). June 23rd, 15 to 20 off Boulmer. July 1st, nine and two off Alnmouth. July 27th, one off Warkworth. September 25th, two off Alnmouth (H.T.). [November 1st, one, probably of this species, off Bamburgh (T.F.H.)] Durham—[On August 29th, in Marsden Bay, after an easterly gale, two Shearwaters, almost certainly of this species, were seen flying south. 'They were near enough to observe their planing careening flight and their plumage, black above and white below' (F.G.G.). On December 26th, one, probably of this species, fairly close to Marsden Rock (F.G.G.).]



[357/358. LITTLE SHEARWATER. Sub-species? 'On September 15th, at 12.45 p.m., I saw a bird fly south off Alnmouth, which it seems must almost certainly have been a Little Shearwater. It had a Shearwater's flight, but it was certainly not a Manx Shearwater, being relatively shorter in the wing, and it beat its wings very much more than that bird does; in fact, it flew for considerable distances without gliding, and when it did glide it was usually to bank round vertically as it changed direction. It seemed to be smaller than a Manx Shearwater, but there was nothing near it for comparison, so I cannot state this for a fact. In colour it was dark on the back, and the underparts were light. It alighted on the water twice for short periods. The weather was clear with a strongish westerly wind. (H.T.)]

[360. GREAT SHEARWATER.—On September 8th, at the north end of Marsden Bay, a Shearwater, which was probably of this species, was seen under good conditions by means of a telescope (25×) and binoculars (8×). A notable feature was its pale rump. A few minutes later two other birds, similar in every respect, were observed. The upper surface of the wings showed grey patches, particularly near the body, and the sides of the head appeared greyish white, while the rump was pale and the tail somewhat mottled below (F.G.G.)]

368. FULMAR.—Holy Island. On February 16th two visitors to the Island deliberately shot from 30 to 40 birds. This wanton and purposeless slaughter of a protected species went unchecked. (Reported by Richard Perry.) On March 24th there were about 36 pairs at the Coves (F.B.). On June 24th, 20 pairs were sitting, of which two certainly had eggs (R. S. R. Fitter). Farne Islands. Of about six pairs present only two bred, one egg was taken, and only one young was hatched (T.R.G.). Near Kyloe, inland colony. May 11th, two birds on ledges. May 30th, 12 present, and three eggs seen (F.B.). June 19th, 12 present and three eggs seen (F.W.). August 9th, a partly fledged young was 'ringed' on a ledge here, but later it was found shot dead on the same ledge (S. and J.S.A.). Budle Bay slopes. June 22nd, half a dozen pairs, but no eggs or young (G.W.T.). Bamburgh Castle rocks. June 1st, 14 birds, and June 22nd, 12 birds present (G.W.T.). Dunstanborough. July 13th, 37 adults present, but no eggs or young (J.R.C.). Cullernose Point. April 7th, only two or three pairs (G.W.T.). July 13th, 37 adults on ledges or flying, but no eggs or young seen (J.R.C.). Hartley Cliffs. First seen in January; in April three to five pairs on ledges; seemed likely to breed; but all left in May (G.R.L.). Marsden colony. First seen off South Shields pier on January 5th (F.G.G.). At the Rock on January 19th, about 20 birds; 29th, 61 birds; February 4th, 87; May 3rd, 172 (F.G.G.). July 12th, eggs seen (I.R.E.). Last seen cruising off Marsden, on September 14th, four birds (F.G.G.). Dawden to Hawthorne Hive. April 7th, about 60 birds (P.L.H.).

The first arrival on the coast for the 1947 season was noted on December 27th, 1946, when one was seen near Souter Lighthouse (F.G.G.).

An inland occurrence. On August 15th, a slightly hazy afternoon, one flew over Forest Hall, Newcastle (M.G.R.).

370. GREAT CRESTED GREBE.—During 1946 no records of breeding were reported from any of the loughs or reservoirs of either county.

371. RED-NECKED GREBE.—October 27th, one seen on Tweed near Berwick, moulting to winter plumage; chestnut colouring on neck, cheeks and underparts pale brown (F.B.).

373. SLAVONIAN GREBE.—April 7th, three in summer plumage off the Stag Rocks, Bamburgh (H.T. and G.W.T.). May 9th, one in summer plumage off Alnmouth (K.I.). Several winter records.

374. BLACK-NECKED GREBE.—On June 23rd and subsequently in July, J.R.C. saw two adults of this species on a flooded field in N.E. Durham. On July 28th two young birds were afloat with their parents. On August 2nd he again visited the pond in company with G.W.T., when one adult and one young were seen under circumstances that made identification of the species quite certain. On August 9th, W.A.C. and G.W.T. visited the pond and saw not only two adults attending on two juveniles, but a third unattached adult. The young were still present with their parents on August 22nd. This is the first record of the breeding of this species in the County of Durham, where it has hitherto only occasionally occurred on passage. On August 13th, H.M.S.B. and S.E.C. visited a pond in N.E. Durham, 15 miles distant from that mentioned above, and clearly identified two juveniles of this species. The last date on which they were seen was September



8th. No adult birds were seen, but a loud rippling note, described as being uttered by this species, was frequently heard. (For further details see *B.B.* Vol. XL, p.21). Observers are asked to keep a look-out for this species in future.

376. GREAT NORTHERN DIVER.—Identified off the coast in February, May and December (F.G.G., H.T. and F.B.).

378. BLACK-THROATED DIVER.—March 21st, at Scremerston, one first winter bird dead on the shore (F.B.). March 24th, one off Holy Island (F.B.). April 14th, one close to South Shields Pier (F.G.G.).

379. RED-THROATED DIVER.—During the winter odd birds may usually be seen in Alnmouth Bay, but numbers increased between the 18th and 22nd March, when *c.* 20 were seen from Alnmouth, and on the following day, 23 were seen off Warkworth links. Numbers then decreased, only one or two being seen on the 25th and 26th; but they rose again in April, in which month there were *c.* 35 on the 5th and 60 on the 19th. In May there were *c.* 20 on the 4th and *c.* 12 on the 9th (H.T.). On March 23rd, from the dunes between Amble and Alnmouth, 86 were counted at one time. They were collecting in small groups just before dusk after fishing all day (J.R.C.).

380. WOOD PIGEON.—A young bird ringed at Blagdon in April, 1945, was recovered in September, 1946, within three miles of where it was ringed (M.W.R.). Another, ringed at the same time, was recovered in December, 1945, at Haswell, Co. Durham, 23 miles S.S.E. Another, ringed at Blagdon on August 17th, 1944, was recovered on November 21st, 1945, at Clough Jordan, Tipperary (S. and J.S.A.).

381. STOCK DOVE.—A young bird ringed at Blagdon on July 27th, 1945, was recovered on December 9th of the same year at Hartlepool, Co. Durham, 31 miles S.S.E. (S. and J.S.A.).

383. TURTLE DOVE.—September, 1945, one seen at Blagdon (M.W.R.). 1946—May 11th, one heard in plantation near Swinhoe (F.B.). May 18th, one seen in cornfield near Fenham Mill (F.B.). June 20th, one seen near Stocksfield (W.A.C.). June 23rd, pair seen near Bamburgh (R.S.R.F.). July 27th, one seen at Darlington Sewage Farm (J.R.C.). August 3rd to 8th, one near Waren Mill, N. (H.T.). August 8th, one heard near Stocksfield, N. (W.A.C.). October 5th, one seen near Craster, N. (W.S.C.).

387. BLACK-TAILED GOWIT.—Spring migration. On April 27th one was seen at Grindon Lough, N., in breeding plumage (T.F.H.). This is the third occasion on which this species has been observed at Grindon in the last week of April (see previous 'Reports'). On April 29th, one was seen on Teesmouth Marshes (J.R.C.). Autumn migration. On August 9th a juvenile on Fenham Flats, N., and another on August 12th and 13th at Alnmouth (H.T.).

389. WHIMBREL.—At Alnmouth, spring migration first noted May 4th, last seen May 30th (H.T.); autumn passage first noted July 7th (K.I.), last seen August 14th (H.T.).

393. WOODCOCK.—On March 26th one was seen flying in a westerly direction down Shields Road, Byker, Newcastle (W.A.W.).

On August 5th a Woodcock was observed carrying a young one between its thighs at Ghyllheugh, Long Horsley, N. (Col. Edward Reed, per S.E.C.).

404. SOUTHERN DUNLIN.—At Grindon Lough, N., on May 4th, five, and on June 29th, one, in breeding plumage (R.G. and E.M.L.). Dunlin have often been noted at Grindon and at other loughs in the breeding season; but no nests have recently been found in that neighbourhood.

406. CURLEW SANDPIPER.—More reported from the coast this autumn than for several years past. Here are a few of the records: Fenham Flats, September 16th, a flock of about 40 (T.F.H.). Seahouses, September 7th to 20th, five on a flooded field near the links (T.F.H.). Alnmouth, first seen August 26th, last seen October 20th, greatest number 16 on September 5th and 6th (H.T.). River Don, near Jarrow, September 15th, at least 36; 17th, at least 21 (F.G.G.); 24th, only 2 (I.R.E.). Jarrow Slake, September 15th, five; 17th, eight; 22nd, one only (F.G.G.).

407. LITTLE STINT.—More reported than for many years past; all juveniles. First noted August 5th, one at Beadnell (S. and J.S.A.). Alnmouth, first seen September 5th, last seen October 10th, greatest number eight (H.T.). Amble Harbour, September 7th to 14th, greatest number seven (A.E.G.). Bamburgh, September 7th one (T.F.H.). Berwick, September 11th to 29th, one to three

(F.B.). Holy Island, September 15th, four (W.E.A.); 21st, two (S.E.C.). Seahouses, September 28th, one (M.K.M.). Seahouses, on flooded field, October 6th, one (H.T.). Cresswell, October 28th, one—the last recorded (W.A.C.). Teesmouth, a small flock during September (T.S.S.). Darlington Sewage Farm, September 10th, one (W.E.A. and M.G.R.).

416. SANDERLING.—First seen at Alnmouth, July 20th, 14; July 27th, eight (H.T.).

417. RUFF.—Not often reported on the spring migration; but on March 2nd one was seen on Holy Island sands (F.B.); one on Budle Bay on March 31st (H.T. and F.J.N.), and one on Hebburn Ponds from April 24th to 30th (J.R.C.).

424. GREEN SANDPIPER.—Several records—most of them in August; but at Alnmouth one was seen on five occasions between September 28th and October 16th, and one as late as November 11th (H.T.). The earliest recorded was on May 18th at Crookfoot Reservoir, D. (P.L.H.).

431. SPOTTED REDSHANK.—On the Don, near Jarrow, on August 11th, one in a flock of 31 Common Redshanks (J.R.C.). September 2nd, one; 15th, two; 27th, one (F.G.G.). Jarrow Slake, September 22nd, one (F.G.G.).

432. GREENSHANK.—This species is seldom recorded on the spring migration, but on May 25th one was seen on a flooded brickfield in N.E. Durham (F.G.G.). One was seen in the same place on April 19th of the previous year (see 'Report' for 1945). Many were recorded for the autumn migration. One was seen on Budle Bay on February 2nd—an unusual date (H.T., T.F.H. and G.W.T.).

435. RINGED PLOVER.—A number tried to breed at Teesmouth, as they did during the war years, but most of the eggs were taken, and only a few young were hatched (T.S.S.).

444. GREY PLOVER.—Not so many reported from the shore during the autumn of 1946 as compared with 1945, no doubt owing to persistent shooting.

446. DOTTEREL.—In mid-May a gamekeeper, who is familiar with this species in Perthshire, reported that he had seen a couple of these birds on a fell at the head of Allendale (G.A.). On June 9th I explored these fells very thoroughly, visiting the exact spot where the birds had been seen, but I saw none, nor were they subsequently reported (G.W.T.). During June I also visited the fells at the head of Weardale, D., climbed Cross Fell on three occasions, C., and traversed the Dun Fells, W., but no Dotterel were seen (G.W.T.).

449. PEEWIT OR LAPWING.—The keeper at Swinhoe, N., reports that the number of nesting birds has become considerably reduced during recent years (F.B.). Very few were to be found in the Redesdale and Upper North Tyndale areas in July (Miss K. Price). 'There is certainly a falling off in nesting in this district, which personally I think is due to the changed habit of feeding of the Rook, and the increase in Carrion Crows and Magpies' (J. W. Nesbit, Keeper, Haughton, Humshaugh, N.). 'Quite a number of birds raised young in the Teesmouth area this year' (T.S.S.).

On October 14th three flocks of some 100 birds were seen to fly in from the sea at Whitley Bay—wind easterly (J.G.G., per C.J.G.).

452. OYSTERCATCHER.—At Netherton, near Thropton, N., a pair hatched three eggs successfully in a field of barley near the field in which they bred last year (T.G.W.). Recorded as breeding in fields near the coast (J.R.C.). Reported from the Tyne, Rede and Till during the breeding season, but no nests located (W.A.C., R.G., W.E.O., and others).

462. BLACK TERN.—On August 12th one was seen at Alnmouth resting on the shore with other Terns (H.T.).

467. SANDWICH TERN.—The colony on the Brownsman, Farne Islands, consisted of 120 pairs and did well. This figure is very small indeed when compared with pre-war years, when 1,200 to 1,500 pairs used to breed normally on the Islands (T.R.G.).

468. ROSEATE TERN.—On June 22nd three were seen amongst Arctics on the Longstone (R.S.R.F.). One or two pairs bred on the Brownsman; but none bred this season on their pre-war site with the Arctics on the Inner Farne (T.R.G.).

469. COMMON TERN.—No breeding was proved on the Farnes this season, though odd birds were seen. The regular pre-war colony on the Inner Farne was not re-established (T.R.G.). On Holy Island nests were found with eggs; but it is doubtful whether any young were reared as the eggs were regularly collected for human food (F.B.). In another less known station on the coast many nests

were seen, several containing full clutches (F.B.). Elsewhere, two or three pairs attempted to nest, and one young at least was hatched (H.T.). At Teesmouth birds were first seen on May 4th, laying began at the end of the month. Nests were found with eggs from June 22nd onwards, but many were robbed (P.M.).

470. ARCTIC TERN.—The colony near the landing place on the Inner Farne estimated to consist of from 300 to 400 pairs, did well this season; as did three good colonies on the Longstone (T.R.G.).

A bird, ringed as a nestling on the Farnes by the late Mrs. T. E. Hodgkin on June 27th, 1938, was recovered where ringed eight years later on June 20th, 1946.

471. LITTLE TERN.—In June and July a few pairs were seen in the neighbourhood of Holy Island, but no eggs were found (F.B., R.S.R.F.). A few pairs haunted the Teesmouth area, and at least one pair reared young successfully; but now that all the shore is accessible to the public conditions are very unfavourable (T.S.S.).

474. SABINE'S GULL.—A new County record. S.E.C. writes: 'On the morning of September 17th, during a heavy gale from the west, which had been blowing strongly for two days, I was on the links near the North Shore of Holy Island, when I observed an unusual gull alight near some Common Gulls resting on the links. It was apparently too weak to stand and lay in a crouching position. I approached to within three yards and noticed that it had a very dark hood, almost black in appearance, with a white band on the forehead. The bill was very dark brown with a lighter tip. I watched the bird for fully ten minutes, when it took flight and alighted about 30 yards away. In flight the all-white forked tail, light grey mantle and black and white primaries were clearly seen, as were its dark legs and feet. I again approached to within four feet, but again it rose, and as it was carried away by the wind I failed to find it again. I clearly identified it as an adult Sabine's Gull in winter plumage.'

477. LITTLE GULL.—January 19th, one immature on Tweed estuary (F.B.). [On September 4th, F.G.G. saw two birds on South Shields beach which were probably of this species.]

478. BLACK-HEADED GULL.—Holborn Moss Colony: At the end of March c. 10,000 birds were present; on May 11th from 6,000 to 7,000; a few of the nests contained one or two eggs (F.B.). At Darden, N., a clutch of six eggs and another of five were seen; also a clutch of three pale blue unspotted eggs (M.W.R.). At Grindon Lough many attempted to breed; in May many were sitting, and in July young were seen (R.G. and E.M.L.). The Greencroft Ponds, D., referred to in the 'Reports' for 1944 and 1945, have this year been entirely forsaken; a few birds came in early spring, but did not remain, and no attempts at nesting were made (F.W.).

481. COMMON GULL.—Numbers roosting at Cheswick, N., increased considerably after mid-March to a maximum of c. 15,000; but by the end of April only c. 1,000 remained (F.B.).

482. HERRING GULL.—Increased as summer visitors to the Farnes and now more numerous than the Lesser Black-backs (T.R.G.). A pair with young on Dunstanbrough cliffs (H.R.O.). A few pairs bred on the top of Marsden Rock, D. (G.W.T.).

484. SCANDINAVIAN LESSER BLACK-BACKED GULL.—On September 15th six were definitely identified on Holy Island (W.E.A.), and on the same day three were seen with Greater Black-backs at Goswick (F.B.). Identified at Hurworth Burn Reservoir, D., on November 4th (28 birds), December 14th and 21st (P.L.H.).

485. BRITISH LESSER BLACK-BACKED GULL.—Two birds spent the summer from the end of April to the end of the year on the Tyne at Corbridge (T.F.H.).

486. GREAT BLACK-BACKED GULL.—Abundant after the first week in September on the N.E. coast; at least 400 collecting nightly on Goswick Sands (F.B.).

487. GLAUCOUS GULL.—On December 26th, 1945, an immature bird was seen with five adult Herring Gulls about a mile west of Hallington Lough, N. This is about 25 miles from the coast and the furthest inland record for Northumberland (H.T.). Several were recorded from the coast, most of them in December (F.W., H.T., F.B., M.G.R.), all of them immature except one adult seen at Berwick (F.B.).

489. KITTIWAKE.—Dunstanborough colony: June 29th, over 100 counted (R.H.O.); July 13th, 38 pairs present (J.R.C.). Marsden colony: First birds arrived between February 4th and 14th, when about 50 were counted; by March



23rd they were there in full strength. On May 3rd a census was attempted, and the approximate number was judged to be 1,500 birds. About the middle of July it was estimated that there were *c.* 950 nests in all, counting those on the Rock and on the mainland cliffs (F.G.G.).

On May 15th at about 6 p.m., I witnessed a late migration off the coast at Craster; well over 100 birds going north during the hour I was able to watch' (H.T.).

492. POMATORHINE SKUA.—October 6th, five seen flying north past Bamburgh (H.T.).

493. ARCTIC SKUA.—On June 27th, one seen off Warkworth—an unusual date (H.T.).

504. CORNCRAKE.—More birds were heard in the Tyne Valley than for many years past. During the Natural History Society's 'All-night Outing' on May 15th in the Stocksfield district, one was heard near Hindley, and two more in fields between Stocksfield and Riding Mill. The Hindley bird was subsequently heard for a month or more, and on one occasion two were calling at once (W.A.C.). From the first week in May onwards a bird was heard on several occasions on Wheel Birks Farm, near Stocksfield, and one morning in June it was caught and released in one of the farm buildings (M.R.R.). On May 12th a bird was heard about a mile east of Haydon Bridge, where it had been the previous year, and another was heard in another field in July (W.J.). A few were seen and heard, in fields from which they have been missing for a year or two, in the Haughton-Humshaugh district (J.W.N.). On May 14th one was heard at Wark (per S.E.C.). One was heard for some weeks during May in fields near North Wylam Station (per S.G.J.). On May 29th, but not subsequently, one was heard on Hole Row Farm, near Consett (E.M.). One was seen at Blagdon, N., in September, 1945, but none was heard in 1946 (M.W.R.). None heard in the neighbourhood of Ewesley, Morpeth, this season (W.T.R.). In June a couple of birds were seen and heard near Annfield Plain, D. (F.W.). July 14th, one heard near Hurworth Burn, D. (per P.L.H.). From June 9th one was heard at Burn Bank, Upper Teesdale, and later, at mowing time, a deserted nest with seven or eight eggs was found (H.W.). One was heard frequently in the early summer at Newbiggin in Teesdale (per H.W.).

509. WATER-RAIL.—On November 2nd, one near Warkworth (A.E.G.) and on the 3rd, after a foggy night, single birds were reported at Alnmouth (H.T.) and at Alnwick (J.E.R.).

511. COOT.—On January 5th no less than 80 were counted on Hurworth Burn Reservoir (R.D.S.). On February 9th, 200 were counted on Holy Island Lough (F.B.).

513. BLACK-CHICK.—Reported to be dying out or very scarce in several districts in Northumberland and Durham; as on the Breamish, east of Cheviot, in Redesdale, at the Northumbrian Loughs and in Upper Teesdale.

514. GROUSE.—After a succession of bad seasons since 1939, Grouse did very well in the early part of the breeding season. The weather was dry, and large clutches of eggs were laid. Many nests contained 10 to 11 eggs, and one of 13 was counted. Later on, the wet summer was unfavourable, and birds were not so plentiful as had been hoped. It will take some years before the normal number of birds can be made up (R.M., G.A., and others).

Key to the initials occurring in the above Report :—M. F. Adams, G. Aikenhead, W. deL. Aitchison, W. E. Almond, J. Annison, S. and J. S. Ash, Miss D. Bell, H. M. S. Blair, Miss E. S. Bolam, H. A. Booth, F. Brady, W. A. Cadman, A. J. Clissold, G. A. Common, S. E. Cook, J. M. Craster, W. S. Craster, M. G. Crawford, J. R. Crawford, D. Crombie, I. R. English, R. S. R. Fitter, C. J. Gent, T. R. Goddard, A. E. Gregory, K. N. Green, Miss C. Greenwell, Miss R. Grey, F. G. Grey, J. W. Harrison, Rev. A. Hervey, B. P. Hill, O. C. Hill, L. P. Hird, T. F. Hird, P. L. Hogg, C. Hutchinson, Rev. K. Ilderton, S. G. Jackson, W. Johnson, Miss E. M. Lobley, W. R. Lofthouse, G. R. Lunn, A. MacRae, J. A. McGeoch, 'M. and C.'—J. A. McGeoch and M. G. Crawford, W. K. Marshall, R. Martinson, P. Mason, E. Miller, Miss M. Monro, F. J. Natrass, J. W. Nesbit, J. B. Nicholson, Mrs. W. E. Oliver, H. R. Oliver, Miss B. C. Paterson, R. Perry, Mrs. M. R. Richardson, C. Ridley, M. W. Ridley, M. G. Robinson, W. T. Rutherford, J. E. Ruxton, T. S. Simmons, G. D. Sinclair, R. D. Sintern, G. W. Temperley, H. Tully, F. Wade, T. G. Wallace, H. Watson, W. Watts, F. White, W. A. Wright.



## In Memoriam

JOHN MARTIN TAYLOR, M.D., D.P.H.

(1886-1947)

DR. JOHN MARTIN TAYLOR, of Thorne, died suddenly on June 8th when on holiday in the Lake District. By his death we lose one of our most energetic and successful field botanists, a man of great personal charm, and one who will be sorely missed by all who had the good fortune to know him.

He was born at Kirkintilloch, Dumbartonshire, on March 12th, 1886, and educated at the Lenzie Academy and later at the Glasgow School of Medicine. He qualified in 1907 and took his M.D. five years later. Soon after leaving Glasgow he settled in practice at Thorne, and apart from serving for a time with the R.A.M.C. in Mesopotamia during 1914-18 war, he remained there for the rest of his life, acting as Medical Officer of Health for the Rural District for over 30 years.



From early boyhood Dr. Taylor was interested in plants, and at the age of 21 he wrote an account of the flora of his native district of Kirkintilloch when a history of that district was being compiled. Botanising remained the hobby to which he turned for relaxation whenever his duties permitted, and in which he found the much needed refreshment during the strenuous war years when he had to carry on the practice without his son's help. But he made no contacts with other botanists, and it was not until early in the last war that a chance remark at a medical board meeting led to the discovery of a kindred interest in a colleague. The botanical friendship thus established with Dr. S. P. Rowlands and through him, and later, with the writer, seemed to increase his interests and activities in field work, and from then onwards he and Dr. Rowlands botanised together whenever possible.

I first came to know him in August, 1941, when the three of us searched for *Peucedanum palustre* and soon re-found it in its original Thorne Moor locality where Taylor had not seen it since his early days in the district. After that first meeting I was a fairly frequent visitor to Thorne, for he and Mrs. Taylor were generous in their offers of hospitality and one had only to mention some plant one wanted to see or to search for when an invitation to stay with them would immediately be given. The summer after our first meeting I was engaged on a survey of the supplies of *Rhamnus Frangula*, which was then in demand for war purposes. Dr. Taylor threw himself wholeheartedly into the search, devoting most of his spare time to the systematic exploration of all the woods within a wide area of Thorne and giving every possible assistance in the work.

Dr. Taylor joined the Yorkshire Naturalists' Union in 1943, and since then no one has contributed so many new or noteworthy records to our annual botanical

reports. His success was due to his perseverance in examining and re-examining any area which seemed likely to yield species of interest, or from which some rarity had formerly been recorded. This painstaking and systematic searching led to the rediscovery of *Viola stagnina* on Thorne Moor, where it had not been seen since the days of James Backhouse. Other good discoveries, some of them made in the company of Dr. Rowlands, include *Euphorbia platyphyllos*, *Carex elongata*, *C. vulpina* and *C. polyphylla*, and only a few weeks ago he found *Fritillaria* in a station where it appears to be indigenous. He had recently taken up the study of bryophytes and had had some success with this group. *Ricciocarpus natans* and *Riccia fluitans* were two of his best discoveries and mention of another will be found elsewhere in this issue.

In 1943 Dr. Taylor began to investigate the aquatic vegetation of the Thorne district, giving special attention to the rich Pondweed flora. He developed a great interest in and enthusiasm for this group, and methodically examined every accessible stretch of dike or canal within miles of Thorne, making hundreds of gatherings. Our correspondence, always frequent during summer time, now developed into a flood of letters and packages exchanged, and one smiles wistfully at the recollection of Pondweeds in basins, trays and dishes, in the house, in the garden and in the surgery, when I went over to be shown some of his best finds. It was fitting that his hard work and careful observations should be rewarded by the discovery of the very rare *P. cognatus*, an account of which appeared in *The Naturalist*, 1944, 121-123. The colonies of plants which he discovered are the only flowering plants of this hybrid ever to be found.

Both as a practitioner and a man Dr. Taylor was highly respected in Thorne. The charm of his personality sprang from a simple unaffected modesty, kindness and humour, combined with complete sincerity, integrity and conscientiousness in his calling. Personal advancement was of no account to him, but to do his best for patient or friend was everything. He was a delightful companion on a botanical outing though too prone to belittle his own knowledge and to give to others the credit for some discovery which properly belonged to him. He was always ready to take others to see the plants he found or to make special journeys to collect and send on specimens which they might ask for. When the Y.N.U. held an excursion at Thorne last year he spared no pains to make the meeting a success and acted as host as well as leader. It is sad to think that our excursions are at an end, for the enjoyment of outings with him was not to be measured by the plants we saw together.

In a letter written on the eve of his departure with his wife to the Lake District he spoke of this botanical plans for the holiday, but after four happy days he had a heart attack and died in his sleep. The funeral service, at which the Y.N.U. was represented by the writer, was held at Thorne Parish Church and attended by a large gathering.

To Mrs. Taylor, their three sons and two daughters, we extend our sincerest sympathies.

W. A. S.

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#### FRED LAWTON

(1856-1947)

THE West Riding has long been noted for the number and quality of its working-men naturalists. Rough and ready, often disconcertingly outspoken; yet generously imparting of their store of knowledge to any and all who were deemed worthy of appreciating it. One such has recently passed away in the person of Fred Lawton, of Skelmanthorp, at the ripe age of 90. Born there in 1856, the son of a hand-loom weaver, he was pressed into the service as a bobbin-winder at the early age of six and in due course became a hand-loom weaver himself. Although his education had been meagre, he set about improving himself and succeeded so well that he could in truth be called a well-read man. His knowledge was not only extensive but varied and it would be difficult to say in which direction he excelled. History, both national and local, whether political or social was one of his favourite studies. He knew his own district, topographically, as those who have rambled with him would testify; while his knowledge of the plants, vertebrates and insects which were to be found in it was intimate, and he was pleased to put it at the service of his fellows. At one time he was on the Migration Committee of The British Association. As a member of a local Naturalists' Society

he had been associated with the Yorkshire Naturalists' Union, and in 1902 became a member. On the formation of the 'Mammals, Amphibians, Reptiles and Fishes Committee' in 1909 he was elected a member, and at his death was the last of the original members. In 1899 he contributed to *The Naturalist* a note on the 'Vernacular Names of Birds at Skelmanthorpe'; in 1907 another on 'Otters near Barnsley'; and a longer account of the 'Reptiles and Amphibians of the Skelmanthorpe District' in 1901. He was a leading figure in the Y.N.U. Excursion to Skelmanthorpe in May, 1897. In 1902, 'The South-West Yorkshire Entomological Society' was founded: Fred Lawton was one of the original members and had been one of the Vice-Presidents for several years until his death.

In 1907 his *Historical Notes of Skelmanthorpe and District* was published. This work contains much valuable information not elsewhere obtainable, and gives proof of painstaking research. He also for some years edited a local publication, *Hirst Buckley's Annual*, which was last issued at the close of 1930.

Family History and Genealogy interested him greatly, induced no doubt by the fact that one of his ancestors was Frances Cutler, eldest daughter of Sir Gervase Cutler, of Stainborough, who, in his will, states that she had married without his consent and against his will: I feel this should be placed on record, as the fact was unknown to Joseph Hunter and has not, so far as I am aware, been published. Until last autumn he had been living his ordinary quiet and useful life respected by his neighbours for miles round his home, and beloved by those who were privileged to know him intimately. His death on March 12th brought to a close a long life and made a gap in Skelmanthorpe which will be difficult to fill. After a service in the Wesleyan Chapel he was interred in the local cemetery on the 15th in the presence of many of his friends. The Y.N.U. and the S.W.Y. Ent. Soc. were represented by E. W. Aubrook, F.R.E.S., of Huddersfield, and J. Hooper, of Thornes. The severe weather and the snow-bound roads prevented more distant friends from being present.

E. G. B.

## SOME OBSERVATIONS ON WAXWINGS

J. LORD, G. H. AINSWORTH

A SMALL party of Waxwings (*Bombycilla g. garrulus*) was noted near Sutton, Hull, on December 2nd, 1946, and the birds were kept under daily observation until their departure on December 19th.

On the first date, 8 birds were counted feeding on hawthorn berries in a thick hedge by the roadside. The birds shared the hedge and berries with Song Thrushes, Blackbirds and Redwings, and there was no apparent antagonism. Although the species is generally described as rather silent, a trilling 'sirri-sirri' could generally be heard from the birds particularly when in flight, but also, although less commonly, when feeding. The note was distinctive enough to enable birds to be located quite easily from a distance. Two other notes were heard from the birds—one a shortened version of the trill and the other a penetrating 'pseep pseep' heard occasionally from feeding birds.

The birds were noticeably fond of perching and preening for long intervals in high trees adjacent to the hawthorn hedges although they also used the hedges themselves for perching. On a few occasions telegraph wires were used. On December 11th, when 15 birds were present, perching seemed to be confined to the hedges and this was a day of pronounced squally weather. At dusk the birds usually congregated in the high branches of a tree and kept up a continuous trilling before departing to their roosting site. The maximum number noted in such a gathering was 21 on December 8th. The departure was just before dusk at 15.45 hours. Several attempts were made at night to find where the birds were roosting. All surrounding hedges were inspected by torch-light and also a neighbouring orchard, but the birds were not apparently roosting in the immediate vicinity of their feeding haunts.

On some days birds were observed to take short flights into the air apparently, on one sunny day at any rate, hawking for insects. On other occasions short circling flights made from the perch were made with no indication of any such object.

Birds very frequently flew down into the road to drink from pools of rain water, a habit which the attendant thrush tribe was not seen to follow. On one



occasion birds were seen to be busy flying down into a grass field. This appeared to indicate a new feeding habit until on closer inspection it was found that small pools of water were being visited. Bathing in pools of water was observed on several occasions.

The food taken consisted of hawthorn berries. The bushes were heavily covered when the birds first arrived. When they finally departed the supply was much depleted although the bushes were not stripped. Song Thrushes, Black-birds and Redwings continued to feed there without difficulty.

The number of birds reached a maximum of 21 on December 8th to 10th, and declined rapidly after December 15th. Only one bird was seen on December 18th. At about this date a large flock was recorded from another part of Hull about a mile away, 80 birds being counted on December 16th. These birds apparently dispersed in small groups during January and in this month and throughout February there were reports of small parties in the western suburbs of Hull. The food taken at this stage was mainly Cotoneaster berries.

## BOOK REVIEWS

**Haunts of British Divers**, by Niall Rankin. Pp. 96 with 82 photographic plates, a frontispiece in colour and 11 pen and ink sketches by Margaret Myddleton. Collins, 12/6. The two British breeding divers, and the Great Crested Grebe are here photographically depicted in great variety of attitude and action by one who has long since mastered his technique. The grebe photographs are magnificent, showing a wealth of graceful outline and of feather detail, as the birds swim, arrange the nest and its contents, sit, and brood often with the young on their backs whilst fish and feather are given to them. The late Dr. Heatherley first photographed the feather-offering episode many years ago. The whole series is a delight.

Little less meritorious are the photographs of the two divers, although the viewpoint in each case, since the nest lay between 'hide' and water, was necessarily 'head-on' and 'tail-on.' Such a pictorial record of the nesting habits and actions of such species could only have resulted from many days of highly-skilled work. Cries and photographs of Curlew and Golden Plover suitably mingle with those of the Blackthroat. Since the Redthroat was worked in Shetland, the birds of Hermaness—Arctic Skua and Bonxie, Gannet and Guillemot, Razorbill and Puffin and Kittiwake are included and are all well up to the author's high standard. Obviously Col. Rankin used no miniature camera! Excellent pictures of habitats, mere and loch, mountain and island, complete the pictorial story; and the accompanying narrative tells how it was all achieved, and relates many an interesting episode of this stage of the lives of these three 'divers.' Not that one of them is classed as a diver as the author is careful to point out; nor do the grebes and divers, even after eliminating the ducks, comprise all our diving birds. But I do not quarrel with the author for bringing them together; the fact that the scope of the book goes somewhat beyond its title makes it all the more worth possessing.—R.C.

**Bird Haunts in Southern England**, by G. K. Yeates. Pp. 110 with 99 photographic plates. Faber & Faber, 15/-. In this, the fourth book recently from his pen and camera, Capt. Yeates brings up to date his publication of accumulated material; and how rich that material is! Bittern and Harrier in Norfolk reed-beds, Crossbills in Breckland; and father south Hobbies and Cirl Buntings, Marsh and Dartford Warbler and Woodlark, and many other birds are covered to the number in all of 37 species, including all the Woodpeckers and concluding with the Black Redstart. The photography throughout is excellent. Bird haunts in various places are described and many problems of great interest to Naturalists, and many little-known habits of birds, are discussed in well-written prose, which flows as readily from the author's pen as good photographs of birds from his camera. The book can confidently be recommended.—R.C.

**Butterfly Lives**, by S. Beaufoy. Pp. 128 with 196 photographs from life by the author. Collins, 12/6. The aim of the book is given as the encouragement of its readers to take a keener interest in the study from life of butterflies, and it appears most likely that this aim will be achieved. Though much of the book is pictorial, for the life histories of 22 species of British butterflies are admirably



and comprehensively illustrated, it should not be considered as 'merely a picture album.' The text is most refreshing and, since it is the product of one skilled in discovering obscure details of life histories writing from personal experience and able to produce photographs of some at least of these details, is sure to stimulate even the weakest interest. Mr. Beaufoy's artistic skill as a photographer was already well known: he illustrated Dr. E. B. Ford's well-received book, *Butterflies*. This volume maintains the previous high standard but one must confess to a certain disappointment to discover that all the photographs are monochromatic. It is commendable that the magnification of each plate is given and it is noteworthy that variation from life-size to  $\times 30$  has been necessary to produce images similar in size of the ova of various species. The book is particularly welcome because it reflects the tendency to go for biological studies to creatures in their natural homes or, when inconvenient to do this, to reproduce the environment as closely as possible. The notes on the methods adopted in obtaining ova illustrate this point. It is a book which should appeal to a wide and growing circle of readers amongst students and naturalists. To these, and to all interested in Lepidoptera, it is strongly recommended.—E.D.

**The Murmur of Wings**, by Leonard Dubkin. Pp. 128, Hurst and Blackett, 10/6. This is not a 'bird book,' but the autobiographical story of one who was born in the poor part of Chicago and advanced to a comfortable position in the same city. As a boy Dubkin had an ambition to become a famed and wealthy naturalist by writing a comprehensive treatise about birds. The urge persisted into adolescence in spite of failures and thwartings, but perceptibly weakened as the years passed. At the beginning Dubkins' interest in birds and other branches of natural history was purely materialistic. He despised so-called 'bird-lovers'; they were anathema to him. At the end of the book he finds an absorbing interest in just watching birds feed on a ledge outside a window of his fifth-floor flat. Having regard to the American background and mentality one may appreciate how the dice seemed to be loaded against Dubkin, and admire his struggles, triumph, how he maintained his interest in the very few birds frequenting the centre of a very big city, and his growth or decline, it depends upon the point of view, from material interest in ornithology to love of birds. One is left wondering at the end whether Dubkin has achieved compensation in his acquired love of birds, or does he still secretly yearn to carry out his original idea of an almost mathematical study of ornithology. If he has not been able to achieve his boyhood ambition, he has at least written a book of considerable interest. The illustrations by Suzanne Suba are a fitting accompaniment to the story.—J.P.U.

**They Labour Mightily**, by Dora M. Walker. Pp. xvi+84+46 plates, A. Brown & Sons, Ltd., 7/6. The inshore fishermen of the Yorkshire coast have long awaited a chronicler. Some at least have now found one in Miss Dora M. Walker who in this book tells of the lives and work of the fishermen of Whitby. This account is written at first-hand, for Miss Walker has for twelve years owned and worked her Whitby-built cobbles, and it is therefore not surprising that we have here a vivid picture of an industry hitherto little known.

In this vigorous record of cobbles and keelboats and those who man them, we see the sequence of line fishing, crabbing, trouting, salmoning, and even tunny fishing. More surprisingly we read of whales on the Dogger Bank chased by an unknown monster more than 30 feet long, with a black and white back, sinuous coils, and a horn! The changing scenes from peace to war, when the keelboats were requisitioned, from fair weather to fog or storm, from times of good fortune to times of fouled propellers, lost lines and craft smashed on the harbour bar emphasise those dangers accepted by fishermen as a part of their daily life. As a corollary there runs throughout the book a central theme of comradeship and warm helpfulness among those who appear the most undemonstrative of men.

This book is warmly recommended to those who know and love the Yorkshire coast. It is lavishly illustrated with photographs by the author, which is particularly remarkable in view of the price.—J.E.H.

**The Hive**, by John Crompton. Pp. 174. William Blackwood & Sons, Ltd. 10/6. Mr. Crompton started to keep bees because of his fruit trees. His attitude towards them quickly changed from mere tolerance to unbounded enthusiasm. The pollination of his fruit trees and the acquisition of honey became

incidental to an insatiable curiosity about every aspect of the habits and complicated-communal life of bees. He read everything he could lay hands on concerning bees, attended lectures, went in for examinations, bought a microscope and studied their anatomy, kept observation hives and did anything and everything calculated to increase his knowledge. It was almost inevitable that he should write a book about them for he is a skilful writer as well as an enthusiastic and experienced beekeeper. If the initiated find nothing new in his account of the life of the bee and of his own fortunes and misfortunes in his dealings with them, they will certainly find nothing dull. Few creatures have more books devoted to them than the bee, yet Mr. Crompton's delightfully written book is a notable addition to the literature on the subject. It is written with wit as well as understanding and with an invigorating freshness of outlook. Anyone with a spark of interest in bees will thoroughly enjoy every line of this book and I suspect that in years to come no beekeeper who admits, in the company of kindred enthusiasts, to not having read *The Hive*, will be regarded as a really well-read man.

**The Intelligent Use of the Microscope**, by C. W. Olliver. Pp. 182. Chapman and Hall, 12/6. This is one of the very best books of its kind which has so far appeared. It is the only one, which, in the opinion of the reviewer, really supplies the practical user of a much-abused instrument with a sufficient basis for pursuing his craft with skill and understanding, without overloading him with unessential matter. The classic tomes of Carpenter and of Spitta, now long out of print, though excellent in their way, contain much which is now obsolete or unnecessary but all too little of some parts of the subject such as photography which are no longer a luxury but have become virtually indispensable. Most more recent volumes intended to cater for a modern reader are seriously defective either on the side of theory or of practice; the present book commits neither of these mistakes. The subject is, limited to the use of the microscope itself and omits all discussion of methods of mounting specimens or of the history of the instrument. It also omits very specialised developments such as phase contrast, ultra violet and pétrological microscopy. For the ordinary visual light microscope as used in biology however it covers the whole range of probable applications with skill and lucidity. The treatment of dark ground illumination, transmitted, reflected and polarised light, simple photomicrography, the uses of colour filters, methods of counting and measurement, critical illumination, etc., are all dealt with simply but in sufficient detail for practical purposes while the optical principles involved in the selection and adjustment of condensers, eyepieces and objectives at various magnifications are explained in a manner which to the reviewer at least appears unexceptionable. A rather unexpected omission is of all mention of a camera lucida or equivalent aids to drawing and this may perhaps be suggested for inclusion in a second edition since the recording of observations is an integral part of microscopy and one which photography alone can never entirely supply. In general however it may be said that every practicing microscopist ought to know all that this book contains but few are likely to read it for the first time without learning something. It is equally suitable to put into the hands of a beginner, provided only that he wishes to understand what he is doing; and of special value to the novice is the very sensible chapter on the selection and purchase of equipment.—I.M.

**The Land of Britain and how it is used**, by L. Dudley Stamp. Pp. 80. Longmans, Green & Co., 2/6. The profound social and economic changes which have taken place in Britain since the first World War have made it increasingly clear that the future prosperity and well-being of the country are dependent on a wise and nationally balanced plan of land utilisation. The remarkable agricultural results achieved during and since the last war have shown what great improvements are possible by careful planning, and an intensification of planning which will equate the needs of industry, housing, food production, forestry and recreation, is required to exploit to the best economic and social advantage the potential resources of the land. The background to these problems is provided by this short account, sponsored by the British Council and written for the layman by an acknowledged authority on the subject. It traces the evolution of land utilisation in Britain in relation to historical developments and physical environment, and the relation between existing types of farming and local climatic, soil and topographical conditions, and concludes with a discussion of the problems of the future, and the lines along which their solution may be achieved.

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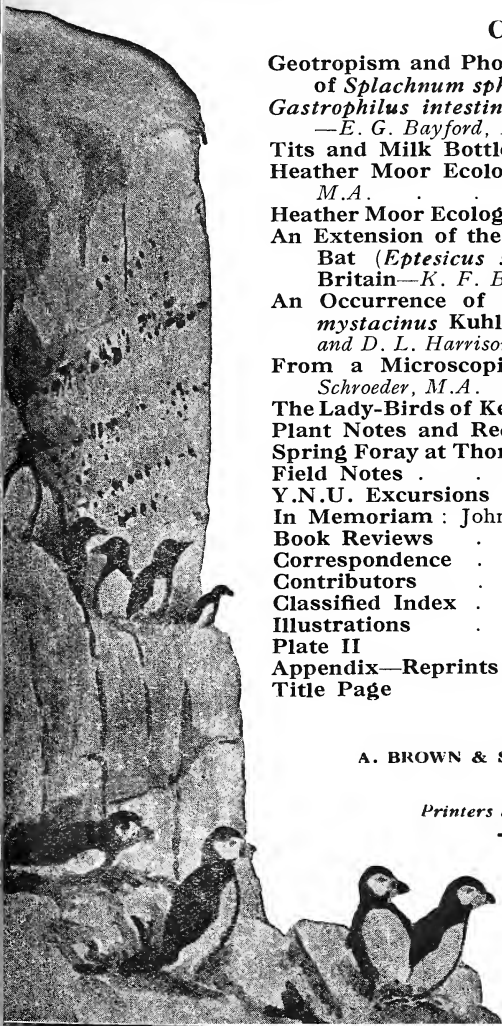
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**Photo 1**

Geotropism and Phototropism of *S. sphaericum*

- L. Geotropic response three days after being placed in horizontal position in dark chamber and consequent vertical growth of seta.
- C. Normal outdoor plants.
- R. Phototropic response after illumination from one direction. Capsules in different stages of development.



**Photo 2**

Geotropism of *S. sphaericum* with intact capsules and capsules removal *before* stimulation. Removal of capsule has no effect on response and indicates the capsule is non-functional in reception of stimulus.



**Photo 3**

Phototropism of *S. sphaericum* 12 hours after exposure to light from one direction. Plants with capsules and upper part of seta covered with opaque caps give no response. The region of growth curvature is just below the capsule (immature).



# GEOTROPISM AND PHOTOTROPISM IN THE SPOROPHYTE OF *SPLACHNUM SPHAERICUM* LINN. fil.

H. WALSH

On the tropic responses of the higher plants to light and gravity the literature is extensive but little information is available on the reactions of Bryophytes. Verdoorn's *Manual of Bryology* (1932) states with regard to the gametophyte, that most stems of mosses are strongly positively phototropic and more or less negatively geotropic, no reference being made to the reactions of the sporophyte. In the Hepatics there is a well-known instance of tropic response of a sporophyte; the sight of *Pellia epiphylla* growing in shade with the numerous dark capsules all growing towards the light is an arresting one. The response of the setae to effect this growth curvature towards the light has been investigated and an account is included in Verdoorn's *Manual*.

In late April, 1946, I had occasion to introduce some plants of *Splachnum sphaericum* into the house and was interested to note that phototropic response of the immature sporophytes to window light was pronounced, and later I found that response to gravity was also a feature of its behaviour. As I have not been able to find any reference to tropisms in moss sporophytes, the results of observations and experiments made during 1946-47 seem worth placing on record.

In H. N. Dixon's *Handbook of British Mosses* (1924), the habitat of *Splachnum sphaericum* is given as the excrement of cattle in boggy places in sub-alpine districts. Mr. C. A. Cheetham in the *Mosses of Yorkshire* (1945) states that it is fairly common on the higher hills. The plants for this investigation were collected on the edge of Erringdon Moor, near Mytholmroyd, Yorkshire, at an altitude between 950-1000 feet. Cattle graze on the moor, the moss occurs on the dung and sporophytes are freely produced. On this moor although there are exceptions in the persistence of the gametophyte stage, the life period of the moss can be completed in about twelve months. The capsules ripen and release the spores mainly during June and July while the cattle are grazing on the moor. If favourably situated the spores germinate within a few days, gametophytes from these appear in late August and September and young sporophytes become visible the following April to mature in summer.

There are special features of the capsule of *Splachnum* that may have significance in relation to its tropisms and these will be discussed later. Here we may say it is generally believed that the basal part or apophysis of the moss capsule plays the more active part in photosynthesis although the whole is often green in colour in the early stages. The genus *Splachnum* is characterised by the possession of a capsule of which the basal part is larger than the sporogenous upper part and when viewed from above projects below it, while in the capsules of mosses generally the basal part is not conspicuous. The peculiar shape of the capsule of *Splachnum* only appears in the later stages of development; in the early stages as seen in the photographs it is cone-shaped, terminating in a fine point. *In situ* on the moor, tropic responses take place so early in the development of the seta that they are not very apparent. They can be observed especially when the plants are growing on the edges of the dung patch; gravity then becomes the stimulus and the setae bend and become vertical.

## GEOTROPISM OF THE SPOROPHYTE

Negative geotropism is strongly developed and maintains the seta and capsule in a vertical position. Although tropic responses occur in the early stages while the whole of the seta is capable of growth, the most informative results are obtained when the seta is allowed to lengthen; the growing region then becomes restricted to the upper portion of the seta and responses are clearly visible. When normal plants with vertical setae and capsules are arranged horizontally in a dark chamber for 24 hours, a growth curvature develops in the region below the apophysis and the capsules are brought back to the vertical position. This is shown in the left-hand group of plants in photograph 1\*. Here the plants have grown in the dark chamber for about three days and the vertical part of the seta

\* I take this opportunity of expressing my thanks to my friend Mr. T. Magson for the contribution of the photographs.

represents the growth during that period, the original position of the capsule being where the horizontal portion ends. If the experiment is conducted out of doors with normal light exposure a similar result is obtained, thus confirming the observation previously mentioned when the plants are growing on the edge of a dung patch.

#### PHOTOTROPISM OF THE SPOROPHYTE

Positive phototropic response becomes evident some hours after presenting plants with normal vertical setae to window light and becomes pronounced after a full day's exposure. The vertical setae develop a growth curvature in the upper region as in the response to gravity that directs the tip of the capsule towards the source of light. Although it is not necessary to enclose the plants and restrict the entrance of light to a frontal aperture, the curvature is more pronounced when this is done. If the plants are not enclosed, top and reflected light from the interior of the room influences the angle of curvature. The group of plants to the right in photograph 1 had been exposed for about three days to window light and not enclosed. The length of seta above the growth curvature response indicates the growth in that period. The central group in this photograph shows young sporophytes with normal light conditions. Tropic responses are effective to a late stage in development when the capsule has assumed its characteristic shape, but earlier stages respond in less time. This has to be considered when noting the time required to effect response to stimuli. With plants having immature setae and capsules, responses both to unilateral light and gravity have been noticed about 5 hours after presentation, but up to 12 hours may be required for very definite curvatures while the maximum curvature may require up to 24 hours. It was found that besides light direct through the window, the setae would respond to reflected light both with and without a mirror. The experimental apparatus consisted of empty metal food containers lined with black paper. To admit light, apertures were cut in one side and the canister with the aperture turned towards the interior of the room, was then placed over the plants. The room has a light wallpaper but no mirror. With a one-inch square aperture it was difficult to see the plants, but phototropic responses occurred both with a mirror placed to reflect window light into the aperture and without a mirror. With an aperture of three-quarters of an inch and the only light being that reflected from the interior of the room, responses took place in about 48 hours. With apertures smaller than this responses were not well defined and with an aperture of one-quarter of an inch and seven days presentation the setae continued to grow vertical as in a completely dark chamber. That these plants were capable of response was proved by turning the canister with the aperture towards the window when phototropic response took place. In the absence of standard apparatus to assess the intensity of light required to effect a response, these experiments indicate that growth curvature can be induced by light of low intensity.

The second and third weeks in June with long daylight was the period when the experiments with reflected light were conducted.

#### RECEPTION AND RESPONSE TO STIMULI

The foregoing experiments indicate that the position of response to stimuli extends only a short distance below the apophysis. This will be referred to as the growing region. To determine the reception of the stimulus to unilateral light, opaque metal paper caps were placed over normal vertical capsules before presentation, and some left uncovered as controls. When the caps extend below the growing region there is no tropic response and the setae continue to grow vertically, while the uncovered capsules respond with a growth curvature. Photograph 3 shows a group of plants with immature capsules in the conical stage treated in this way and exposed to unilateral light for about 12 hours. The position where growth is effecting the curvature of the capsule towards the light is seen to be at the top of the seta. With shorter caps just covering the capsule and leaving the growing region exposed, normal positive response to light occurs. This indicates that both reception and response only occurs in those cells of the setae capable of growth and that the capsule is not involved in reception. Reception and response is considered to be a direct one and not as in the Oat coleoptile,

when the centres of reception and response are separated by less responsive tissue. This is also indicated when the capsules are completely removed from plants with vertical setae without damage to the growing region; the plants now without capsules along with intact plants as controls when exposed to unilateral light or horizontally to gravity in a dark chamber will respond by the appropriate growth curvature. In photograph 2 many sporophytes have been cut away to give clear vision of the remaining four. Two of these, while in the vertical position had the capsules removed, then the setae were placed horizontally in a dark chamber for about 48 hours. That the removal of the capsules had no effect on the geotropic response is clearly shown.

#### DISCUSSION

In the three British species of *Splachnum* the apophysis is more or less spherical. In a non-British species *S. luteum* the apophysis has the shape of an open umbrella, the surface area being greater in relation to the sporogenous upper portion of the capsule than in the British species. This species has been the subject of a paper by J. R. Vaizey, 'On the Morphology of the Sporophyte of *Splachnum luteum*' (*Annals of Botany*, vol. 5, 1890). The author in describing this remarkable structure with its chlorophyll cells, air spaces and stomata similar to flowering plants, states 'that the apophysis performs the function of a leaf and is therefore analogous with the leaves of vascular plants, I think there can be no doubt.' D. H. Campbell in *Mosses and Ferns* (1895), includes an illustration of a section through the capsule of *S. ampullaceum* with the remark 'the apophysis of the genus *Splachnum* forms a largely developed expanded body which must be looked upon as a specially developed assimilating apparatus.'

This conception of the apophysis is supported, as described in the present paper, by the tropisms of the sporophyte, which, by the response of the seta direct the capsule towards the source of light. All the capsule of *S. sphaericum* is green in colour to a late stage in spore formation; as the spores mature the sporogenous portion changes to light brown while the apophysis remains green to a later stage, finally becoming dark brown.

#### SUMMARY

Experiments show that geotropism and phototropism are features of the sporophyte of *S. sphaericum*. In the earliest stages of the elongation of the seta all its cells are capable of growth and reception and response can take place at this stage. As the seta elongates the growth region becomes restricted to the upper portion and this then becomes the receptive and responsive area. The tropic responses are considered in relation to the photosynthetic function of the sporophyte.

#### FIELD NOTE

**Green-veined White Butterflies Roosting.**—On the evening of August 2nd, I was walking beside a stream looking or listening for birds. It was just about dusk and dew was beginning to fall. At one point I seemed to disturb a number of white butterflies and stood still to watch them. Gradually they began to settle down again, but I noted that all came to one point on the ground. When almost all had come to earth again a quiet and slow approach was made to the favoured spot and there on the blades of rough pasture grass was an assembly of Green-veined Whites (*Pieris napi*). The area occupied was barely one square foot of land and here were 32 butterflies packed close together with odd ones still coming in. A peculiar feature was that on the approach and preparatory landing flutters of each new arrival, every one of those already hanging from blades of grass would half open and quiver their wings—there was not room to expand them fully—as much as to say, 'Do be careful, this place is occupied.'

I watched till it was almost too dark to see them: there must have been nearly 40 butterflies perched on, or rather hanging from, blades of grass on that square foot of land when I left.—J. P. UTLEY.



**GASTROPHILUS INTESTINALIS** Degeer (*G. equi* Clark)**An Addition to the Yorkshire List of Recorded Diptera**

E. G. BAYFORD, F.R.E.S.

BEING confined to a limited area is an irksome condition, but it is not without compensation. Since July of last year my principal sphere of investigation has been a tract of rough land comprising about 13 acres over which the lessee has generously permitted me to wander at will. It is divided into two main parts, each of which is subdivided by hedges of hawthorn and elder. Luxuriant patches of Nettles, Tansy, Ragwort and Good King Henry are much in evidence, and on the other hand *Heracleum*, *Epilobium* and *Linaria* although common enough outside the area are notably absent. The two parts are let for grazing purposes and latterly there have been three horses in each part.

On the 6th August as I was strolling through I was attracted by the antics of a large fly which persistently hovered about two horses which were grazing together. It almost seemed that I could catch it by hand, but it eluded every attempt to do so. The following day I went out with a net but did not see it. However, next day I was successful in netting it at the first attempt. It proved to be a female of *Gastrophilus intestinalis* which Mr. Cheetham informs me has not been recorded from Yorkshire. Wingate in his *Durham Diptera* marks the species as not recorded from that county also. Despite this apparent rarity, I cannot believe that it is of rare occurrence, and am of the opinion that veterinary surgeons and owners of horses would assert that it is, unfortunately, too common in both the counties named and elsewhere in the British Isles. Since the above capture I have seen others but attempts at capture startled the horses and caused them to stampede and I could not get near them again. Having spent some considerable time in observing the habits of this pest, the following brief account may be a help to recognising it in the field. It appears to make its attacks mainly in the hot sunshine, and then flies quite close to the horse, selecting chiefly the shoulders, flanks and legs. When thus engaged it looks like a small bumble-bee, and carries its hind legs hanging down beside and beyond its apparently broad, squat body. This illusory appearance is due to the hinder segments of the body, which are sharply narrowed to the apex, being incurved and thrust forward towards the horse. This allows it to deposit its eggs singly on the hairs without alighting. All the time it is noiseless; there is no humming or buzzing, but the horse seems fully aware of its presence, and is apprehensive and restless. An indication that the larvae which have been hatched in the mouth are making their way via the tongue and throat into the stomach, is when the horse opens its mouth and protrudes its tongue to the fullest extent. This action, instead of resisting, really assists the larvae to reach their desired goal.

The eggs are light in colour and very conspicuous, especially when massed by the hundred.

An excellent figure with description is given by Westwood (*Introduction to the Modern Classification of Insects*, 1840, Vol. II, p. 579) and its life-history is detailed and illustrated by Miss Ormerod (*A Text-book of Agricultural Entomology*, 2nd Edn., 1892, pp. 65 and 66).

*Note.*—This account is based on the female only, the male is different in appearance and in its actions also.

**TITS AND MILK BOTTLES**

R.C.

To endeavour to work out the way in which this formerly occasional, now more frequent, practise of opening milk bottles by tits has spread, data is being gathered for the B.T.O. by Messrs. R. A. Hinde and James Fisher. Anyone having relative information could send it to R. A. Hinde, 31 Mount Pleasant, Norwich. Any notes having bearing on the subject are wanted including:—species of bird, locality (parish and vice-county), year in which practise first noted, year in which it was first possibly noted (by first use of such bottles, or by residence of observer), type of bottle and covering, and method employed. Reports of areas where the habit is unknown are also desired.



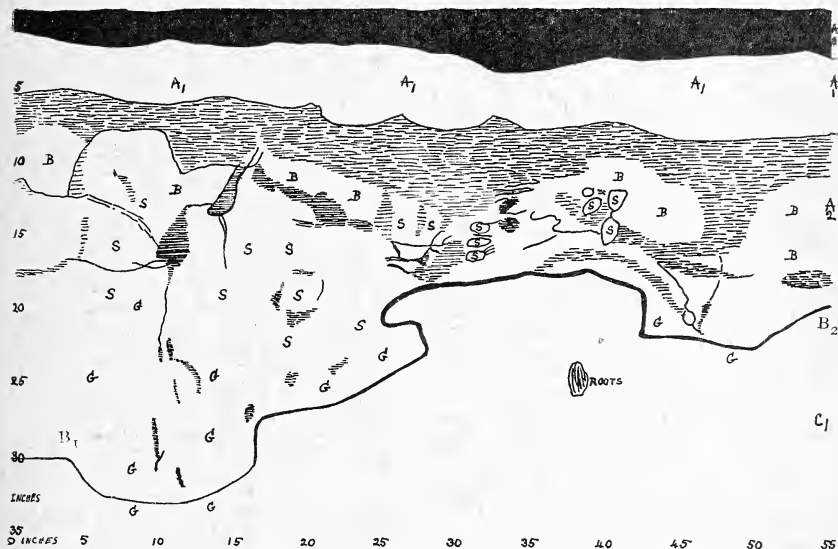
## HEATHER MOOR ECOLOGY, No. 2

## Further Report of the survey made by the Bradford Naturalists' Society at St. Ives, Bingley\*

A. MALINS SMITH, M.A.

## SOIL PROFILES AND SOIL ANALYSIS

THE usual soil profile under Ling is well known and is a podsol formation now familiar to students of soil science (cf. *Vegetation of Britain* by A. G. Tansley, or *Soils* by G. W. Robinson). The essential feature of a podsol is that it shows a removal of material from the upper layers to the lower layers of the profile. The upper layers from which material is removed downwards are called the eluvial or



EXPLANATION OF FIG. I.

## Layers of Soil :

- A<sub>0</sub> = Peat.
- A<sub>1</sub> = Bleached sand.
- A<sub>2</sub> = Hatches and streaks are black on a background of B—bleached sand.
- S—orange sand and G—bluish-grey clay.
- B<sub>1</sub> & B<sub>2</sub> = The irregular line of pan running across the whole figure.
- C<sub>1</sub> = Horizon of parent material.

'A' horizons and the lower layers into which the material is moved, the illuvial or 'B' horizons. The layers revealed by a soil profile at St. Ives are : A<sub>0</sub> Peat, A<sub>1</sub> bleached sand with whitish sand-grains, A<sub>2</sub> partly bleached sand with yellowish grains and darker streaks and patches, B<sub>1</sub> a thin black layer of organic matter, B<sub>2</sub> a hard brownish layer called the moor pan or iron pan. Below all these is C<sub>1</sub> the unaltered parent layer derived from sandstone: Such a profile shows chiefly the downward transference of iron compounds which, when oxidized, give a rusty brown, orange or yellow colour to the soil. The removal of these compounds leaves the soil with whitish grains and so produces the layers A<sub>1</sub> and A<sub>2</sub> which are wholly or partly bleached. The iron compounds are deposited in layer B<sub>2</sub> the iron or moor pan, which is often, as at St. Ives, a hard, compact, but thin layer of a deep brown colour. Carbon is another material washed downwards from the layer A<sub>0</sub>, leaving black streaks and patches chiefly in layer A<sub>2</sub>, and finally being deposited in layer B<sub>1</sub>, the black layer just above the pan. The evidence of downwash of iron and carbon shows that whatever the up and down movements of the water in the soil at various times, the total effect is a downward one. As would be expected,

\* For previous report see *The Naturalist*, 1945, p. 45.

such downwash movements are more commonly found in the regions of higher rainfall and the typical moor at high elevations in the north-west of England and in Scotland is commonly correlated with (1) higher rainfall, (2) mist and higher humidity of the atmosphere. The former (1) increases the downwash through the soil and the latter (2) checks evaporation and therefore checks upward movement of water in the soil when drier periods occur. The minimum amount of rainfall necessary to produce such a podsol profile is not known. Cheetham (*Nat.*, 1924) says that 35 in. per annum is the minimum for the formation of Cotton-grass deep peat, but thinner peats under Ling are found in many parts of Britain which have a lower rainfall than this. The rainfall at St. Ives is a little over 33 in. per annum and I have stated in the first report that this lower rainfall is one of the factors responsible for the prevalence of Ling at St. Ives as compared with the much greater tendency to form Cotton-grass in the Austwick district with a rainfall of 46 in. per annum. The formation of moor pan in the heaths of eastern and southern England with rainfall of only 20-30 in. is often now attributed to an earlier climatic period of higher rainfall. The moorpan, once formed, has persisted to the present drier period and the pan may therefore be described as a fossil pan. The question whether it is one of these fossil pans may arise in connection with the St. Ives pan also. The practical importance of the pan lies in the fact that plant roots very seldom penetrate the hard moor pan and thus the depth of soil available to provide nourishment for the plants is strictly limited. If land with moor pan is required for crop plants, it is necessary, at least in the case of shallow pans, to break it up by deep ploughing and with the increase in the depth of root range thus rendered possible, satisfactory crops can be obtained. This has been done several times in the eastern counties.

The iron pan is thus a horizon of great importance and yet the method of its formation is by no means precisely known. Certain observations made at St. Ives may shed light on this problem and these I now proceed to describe.

Three pits were dug under Ling and for comparison two under Bracken outside the Ling area, but on similar soil. In discussions on the podsol profile it has been usual apparently to think of the iron pan as level or nearly so. In the third pit dug under Ling the most striking feature was a very considerable irregularity of the level of the iron pan and I give the line of this pan ( $B_2$ ) in some detail in Fig. 1. The pan varied in depth from  $17\frac{1}{2}$  in. below the upper surface of the peat to 33 in. below, and this within a horizontal distance of 28 in. The ascertained facts about this irregularity are that the highest level of pan runs beneath the coarsest soil (sand) and that the lowest level is below the finest soil (clay). It is also very noticeable that the pan layer is thickest at its highest level under the sand and thinnest at its lowest levels under the clay. This applies also to the carbonaceous layer ( $B_1$ ) resting on the pan. Small boulders from this pit were sent to Dr. Versey, of Leeds University, and I thank him for the following description: 'Most of the specimens are just variations of the ordinary sandstone in the Millstone Grit series and thus give no special information. The smallest piece of all is, however, a black chert which cannot be found *in situ* nearer than Skipton. This, therefore, must be an erratic and Boulder Clay is indicated.'

Fig. 1 also shows the upper portion of the soil profile through which this irregular pan runs. There are the usual horizons  $A_0$  Peat,  $A_1$  Bleached sand,  $A_2$  much streaked and shaded with black on a general ground of orange-coloured sand and some bluish-grey clay. In the region of the lowest pan level,  $A_2$  is pretty clearly divided into an upper portion which is orange-yellow sand and a lower portion almost entirely of bluish-grey clay, though in both parts there are small portions of the material of the other part. The material of the lower portion continues below the pan with little change. I described these layers to Dr. Versey and in comment on them he stated: 'The details you give seem to imply the sort of mixing that one might get on a slope. [The slope on this Ling area is only slight.—A.M.S.] The bluish-grey clay seems likely to be a Boulder Clay, while the orange-yellow sand might just be a Millstone Grit weathering product.'

My first analysis of the soil was made to ascertain the nature of the black soil more or less scattered in pockets or in some places more uniformly distributed over the orange and grey background of horizon  $A_2$ . According to current ideas of the podsol, this was likely to be carbonized organic matter on its way down to the pan level. Dr. Versey suggested, however, that black patches were in some localities, especially in glacial sands, due to manganese compounds.

I took samples from three black patches in Horizon A as follows :

Sample A	.	.	.	.	21 in. above pan.
„ B	.	.	.	.	16 in. „ „
„ C	.	.	.	.	6 in. „ „

These three were mixed together to form sample 1. From the yellow or orange-grey soil without any black tint I took a second sample at 13-16 in. above the pan and close to sample B above. This single sample formed sample 2. The samples 1 and 2 were then analysed for moisture and organic matter in the usual way. Results :

		Organic matter	Water
Sample 1	.	20.6	5.03
„ 2	.	6.4	2.38

All figures are percentages of oven-dry soil. Thus the black patches were much richer in organic matter than the orange-grey soil not tinted with black, and it seems therefore to satisfy the general podsol theory that it is carbonaceous matter being washed down from the peat. The figures for water give the usual result that the soil with more organic matter also contains more water.

Mechanical analyses were made of three samples :

- (1) from bleached layer A<sub>1</sub> ;
- (2) from just above pan in A<sub>2</sub> ;
- (3) from just below pan in C<sub>1</sub>, where pan was 17 in. below surface.

Equal weights of air-dry soil were well shaken with water simultaneously in three measuring cylinders each filled to the 100 cc. mark. They were then allowed to settle for 3 mins., 8 mins., 18 mins. and 21 hours with the following results :

		cc. of settled material.		
		Bleached layer	Above pan	Below pan
3 mins. fall	Corresponding roughly to the sand fraction	33.6	31.0	28.0
8 „ „	Coarse silt	4	3.4	2.0
18 „ „	Fine silt	2	1.6	2.2
21 hours fall	Clay	0	0.5	1.4

This shows most sand and least clay in the bleached layer while the layer below the pan has the most clay and the least sand. These results show the general washdown of the finer particles in the soil to lower horizons, a parallel instance to the well-known difference between the soil and sub-soil of cultivated farmland.

I now turn to profiles under Bracken which is the dominant plant on an area of much steeper slope on the south-east border of the Ling area. See Fig. II.

#### Pit 4, Bracken v. flourishing.

- |                |  |           |
|----------------|--|-----------|
| A <sub>0</sub> | (1) Black soil with interwoven rhizomes of Bracken and with roots. In lower 10 inches of this a close mass of large stones             | 18-19 in. |
| A <sub>1</sub> | (2) Bleached grey sand with chocolate patches  | 8 in.     |
| A <sub>2</sub> | (3) Orange sand, not so coarse as (2), having black streaks and spots  | 10 in.    |
| C              | (4) Paler heavier soil, much like the soil below the pan in Pit 1, under Ling, and evidently the parent material of the whole profile. | 1 in.     |

A significant fact about this profile is that, though it is clearly a podsol, with a well-marked bleached layer and a washdown of black organic matter, it shows no pan. The water in this pit was never stagnant, as it was in the pits under Ling, this pit being dry in a few hours after even the heaviest rain, e.g. on July 4th, 1944, after continuous rain all through the previous day, the pit among Bracken was quite dry, while all pits under Ling were full or nearly full of water.

It seemed clear, therefore, that presence of pan in the Ling area was connected with the stagnation of water in the soil and its absence under Bracken to the much freer drainage. The primary cause of the freer drainage was the steeper slope of the soil, so that the iron from the bleached layer washed away into the drainage water too rapidly to form a fixed layer of iron pan.

Another pit under Bracken, Pit 5 (See Fig. II), was dug on June 3rd, 1944. It showed the following layers :

A <sub>0</sub>	(1) Humus layer with Bracken rhizomes . . . . .	10 in.
A <sub>1</sub>	(2) Bleached layer with chocolate patches . . . . .	8 in.
A <sub>2</sub>	(3) Orange-brown sand streaked with chocolate . . . . .	9 in.
C	(4) Pale yellow, sandy, parent material, harder than the layers above . . . . .	6 in.
Total . . . . .		33 in.

This pit was, in general, similar to the first pit dug under Bracken, the chief difference being that the layer of humus and rhizomes was much shallower and the thick layer of boulders in this horizon was absent.

Some points of comparison furnished by all the pits dug at St. Ives, viz. : three under Ling and two under Bracken, may now be summarised. I have added for comparison and contrast, measurements made in a trench (Pit 6) on Rombalds Moor, near Keighley Gate. Fig. II shows the main points of all these in diagrammatic form and the measurements are given in the following table :

		<i>St. Ives Callunetum</i>			<i>St. Ives Pteridietum</i>		<i>Rombalds Moor Callunetum</i>
<i>Horizon</i>		<i>Pit 1</i>	<i>Pit 2 over rock</i>	<i>Pit 3 a b</i>	<i>Pit 4</i>	<i>Pit 5</i>	<i>Pit 6</i>
Peat or Humus	A <sub>0</sub>	3.3	2.8	4.0 2.4	18.5	10.0	9.0
Bleached layer	A <sub>1</sub>	3.7	4.8	3.2 2.4	8.0	8.0	1.0
Orange sand (a) with or without blue-grey clay (b)	A <sub>2</sub>	9.0	9.5	10.0 a 12.2 b 16.5	10.0	9.0	4.0
Iron pan with narrow black layer above	B <sub>2</sub> and B <sub>1</sub>	At 16 (average) unlevel and varying from 14-17	No pan but dark chocolate layer on rock at 17	At 17 33.5 In the same pit	No pan	No pan	Soft level pan at 14
Unaltered parent soil	C <sub>1</sub>	17.6	Rock	18.0 1.5	1.0	6.0	12.0

All measurements in inches.

#### PENETRATION OF ROOTS OF CALLUNA

PIT 1.—Roots frequently found in A<sub>2</sub> layer, e.g. at 8 in., 10 in., and also down to the level of the pan at 16 in.

PIT 2.—Roots in A<sub>2</sub> layer and particularly numerous in the dark chocolate layer on the rock at 17 in.

PIT 3.—A pocket of healthy roots was found 6 in. below the pan where the pan was at its highest level and thickest. This is the only instance at St. Ives of roots being found below the pan. In this pit in a position where the pan layer was 21 in. deep, roots were found at a depth of 20 in., i.e. just above the pan. Roots occasionally are found in special abundance under boulders as if there occurred there a flow of water especially rich in food.

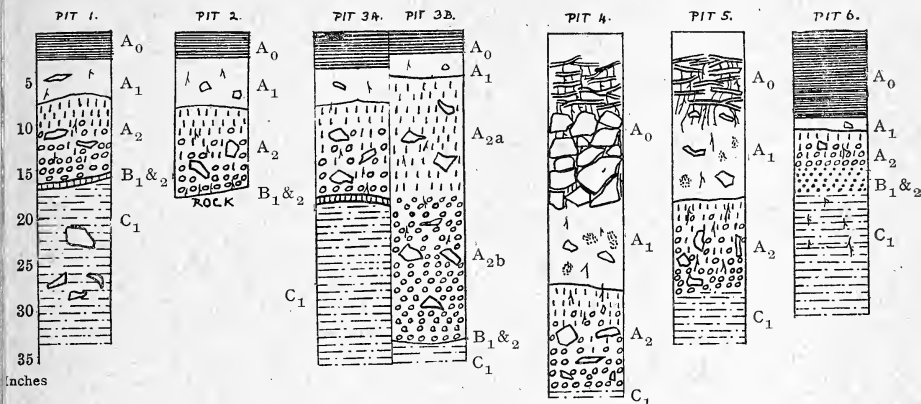
#### PENETRATION OF ROOTS OF BRACKEN

In both Pits 4 and 5, roots were seen throughout layers A<sub>1</sub> and A<sub>2</sub> but none in C<sub>1</sub>, the unaltered soil below.

PIT 6.—Here the pan was soft and roots of *Calluna* penetrated freely below the pan. There was also evidence that carbonaceous material was carried below the



pan in small quantities, as the yellow sandy layer below the pan had occasional faint black streaks and patches. There is, however, no evidence of the iron removed from the bleached layers being deposited below the soft pan, for stones or small boulders from the bleached layers were bleached silvery-grey and were



EXPLANATION OF FIG. II.  
Horizons as in text and Fig. I.

Pit 3A shows a profile where the pan is highest and thickest.  
Pit 3B shows a profile where the pan is lowest and thinnest.  
In 3B the horizon  $A_2$  is clearly divided into two parts as indicated.  
In the other profiles there is no clear division of  $A_2$  into parts.

$\lambda\lambda$  Roots.

$\dots$  Black patches.

$\square$  Stones or small boulders.

also peat-stained, while the boulders below the pan were sandy-yellow like the sand round them and unstained by peat.

With this group of facts before us we realise that the St. Ives Callunetum grows on a fairly uniform sandy soil with a hard iron pan at about 17 in. below the surface of the peat. Exceptionally there occur pockets of glacial clay as seen in Pit 3, and in these the pan is deeper up to 33 in. and thinner. The trench from Rombalds Moor, with its much thicker layer of peat, its very narrow bleached layer, its rather shallow and soft pan, with *Calluna* roots penetrating freely through it, shows such striking differences as to point to a different mode of pan deposition. It is formed in a region of somewhat higher level, 1,250 ft., and of slightly higher rainfall 36 in. (See Rainfall Map, British Assocn. Handbook, Leeds meeting, 1927).

The absence of pan under Bracken, although the profile shows clear evidences of being a podsol, has already been commented on.

#### GENERAL DISCUSSION OF PAN FORMATION

I do not intend to enter into the theory of pan formation which is rather the sphere of the agricultural chemist. There appear to be two main theories. One, associated with the names of Morison and Sothers, is summarised thus in *Soils* by G. W. Robinson, p. 244: 'In winter there is a downward leaching of ferric oxide (and possibly alumina) in colloidal solution. Precipitation of iron sesquioxide from the colloidal solution occurs in the summer drying of the profile.' This means that the iron rises up from below in solution, and is deposited at the pan in summer after having been washed downwards by the winter rains. The chief difficulty of this theory is to account for the deposition of the iron at a definite and narrowly localised layer such as occurs in the St. Ives and many other areas. It is suggested that the pan is formed close above the permanent summer water table. This idea must fit not only the ordinary pan of even level, but also the very irregular pan depicted in Fig. I with its great difference of depth between

the lighter and heavier soils found there. It is also difficult to think of the summer water table as being at any fixed level; as being the same, for instance, during a dry summer like the present as in the continuously wet summer and autumn of 1946. We must keep in mind on the other hand that the actual period and the climate when the pan was formed is not known. In any case this theory seems to account better for pans which are thinly distributed over a considerable depth of soil, such for instance as the soft pan of Rombalds Moor, Fig. II, Pit 6, or those of some Scottish profiles described by Tansley in the *Vegetation of Britain*.

A second theory is expressed as follows by G. W. Robinson, *Soils*, p. 241: 'There is generally some mechanical eluviation in podsol profiles. Accumulation of colloidal material in the B Horizon is most marked in light soils. This accumulation may lead to impedance of drainage with consequent waterlogging, e.g. Bagshot soils. The formation of a horizon of restricted permeability is a factor in the precipitation of sesquioxides and the formation of pan.' This seems to imply that the iron is washed down and deposited at once as a pan layer, because the molecules will not pass through the very small interstices of the colloidal material already deposited at a definite level. Once a thin layer of pan is formed this process would be cumulative. This theory seems to account better for a restricted pan of definite level, because the level is already fixed by the position of the accumulated colloidal material. It seemed possible for me to test this theory by finding out if there were any difference in the mechanical composition of the layers just above and just below the pan, because one would expect on this idea a layer of finer particles with smaller interstices just below the pan. Accordingly, samples were taken in Pit 3 from just above the pan at its highest level (Sample A) and just below the pan at the same place (Sample B). These two samples had already been mechanically analysed by deposition in water, with the result that B showed a higher proportion of finer particles than A. They were now analysed according to the standard method, instructions for which were sent me by Prof. N. M. Comber, of Leeds University, whom I wish to thank for his kindness in this matter.

#### Results :

	A	B
Coarse Sand . . .	42.15 per cent.	41.1 per cent.
Fine Sand . . .	20.30 "	20.8 "
Silt . . .	15.00 "	22.5 "
Clay . . .	15.00 "	12.5 "
Ratio :		
Coarse and Fine Sand	62.45	61.90
Silt and Clay	30.00	35.00

This confirms the previous analysis by water in showing a higher proportion of finer particles, with which colloidal material is associated, in the sample B.

Another pair of samples was taken at the lowest level of the pan in the same pit and labelled C and D, C being just above the pan and D just below.

#### Results :

	C	D
Coarse Sand . . .	29.0 per cent.	41.8 per cent.
Fine Sand . . .	21.0 "	18.7 "
Silt . . .	17.5 "	20.0 "
Clay . . .	27.5 "	20.0 "
Ratio :		
Coarse and Fine Sand	50.0	60.5
Silt and Clay	45.0	40.0

It is seen here that the sample *below* the pan is more sandy.

Thus the analyses in the deeper position show no sign of the denser layer below the pan required by the second or downward deposition theory. On the other hand, the thicknesses of the pan in the different positions seem easier to account for on a downward deposition theory. The local plug of glacial clay will be a great hindrance to downwash of water, diverting the downward water movement sideways to the more porous sand, and therefore contributing to a thicker pan there and leaving little iron for deposition at the lower level in the clay itself.

On the upward deposition theory there seems no reason for these differences of thickness, since the pan is presumably deposited from a uniform solution.

There are difficulties in applying either theory at St. Ives and further analyses are evidently required. The analyses already made brought out clearly the colour of the sand fractions in samples A, B, C and D. The sand fractions of both A and C were yellowish-white, while those of B and D were yellow. This shows that right down to the pan, whether shallow or deep, there has been bleaching by removal of iron, while immediately below the pan this bleaching ceases.

#### WATER-LEVELS IN THE AREA

At various times, after rain, standing water was found in the pits and Prof. Pearsall suggested to me that it would be interesting to take a series of records of the levels of the water in relation to the iron pan. This I did throughout the whole period of my observations. The results are given in the table.

TABLE OF WATER-LEVELS FROM PIT I

Date	<i>Position of water level in relation to pan.</i>		<i>Remarks on weather</i>
	<i>—below</i>	<i>+above</i>	
<i>in cms.</i>			
1943			
Mar. 6	—44	(at least)	After a spell of dry sunny weather, beginning about Feb. 1st.
„ 17	—44	(at least)	„ „ „
April 17	—44	(at least)	„ „ „
„ 26	—4		Heavy rain to-day.
May 15	—44	(at least)	
June 19	—30		After two days' rain.
Aug. 14	+1		After cool weather with some rain.
Sept. 11	+40		After very heavy rain for 48 hours.
Oct. 26	0		After variable weather.
Nov. 24	+7		Very heavy rain on day of visit.
Dec. 28	+10		After mild dry sunny week.
1944			
Jan. 30	+26		Three days' heavy rain, Jan. 22nd-24th.
Feb. 23	—22		Thin snow and later drizzling rain recently.
„ 26	0		Snow turning to rain on day of visit.
Mar. 26	—44	(at least)	After long dry spell.
May 1	—40		Dry and sunny recently, heavy rain mid-April.
„ 6	+11		Heavy rain previous day.
„ 21	—44	(at least)	Dry recently.
June 3	—44	(at least)	After variable weather.
„ 29	—23		Wet to-day and on two of the three previous days.
July 4	+35		Continuous heavy rain all previous day.
„ 8	+16		
Aug. 3	—44	(at least)	After dry but dull weather for two or three weeks.
„ 23	0		After variable weather, heavy rain on 19th, 20th and 21st.
„ 30	+2		
Nov. 25	+39		
1945			
Feb. 24	+16		After warm dry weather.
Mar. 24	—44	(at least)	„ „ „
July 7	—44	(at least)	Heavy rain (thunderstorms), July 1st.
Sept. 8	—44	(at least)	

I have stated that the water level was *at least* 44 cms. below the pan whenever the pit was dry, for it is obvious that it was impossible to tell how far below the bottom of the pit the water-level was. The depth of the pit was 44 cms. below the average level of the pan.

The periods between the observations are irregular, as I made these observations at every visit, whether a shorter or longer interval had intervened.

An obviously important result is that the present summer water table (I should prefer to call it 'dry period' water table, since it occurred each year in March as well as in summer) is much below the pan level. If, as on the Morison and Sothers theory of pan formation, the pan is formed just above the summer water table, then the present pan must have been formed at some earlier period of heavier rainfall and a climatic change must have occurred between that time and this. If so, the present pan must be a 'fossil' pan as the pans of the East Anglian and southern heaths appear to be. As, however, all this depends on the validity of the Morison and Sothers theory as applied to the St. Ives pan, I will not pursue it further.

The very wet state of the area on July 4th, 1944, enabled me to measure the rate of fall of the water table in the pits:

July 4th—Water level in Pit 1: 5 cm. below surface of pit.

„ „ Pit 3: 16.5 cm. „ „ „

July 8th—Water level in Pit 1: 24 cm. below surface of pit.

„ „ Pit 3: 34 cm. „ „ „

In four days the water had sunk:

In Pit 1—19 cm.

In Pit 3—18 cm.

} Weather warm and showery between, with a fair amount of sunshine.

These are the same to a sufficient degree of accuracy and mean that in these summer conditions the water level sank at the rate of 4.5 cms. per day. This comparatively slow rate is a great contrast to that under Bracken and fits in with Prof. Pearsall's remark (see p. 47 of first report) that the samples he had analysed suggested '*retardation* of drainage following recent rains.'

It must be pointed out that in taking the water levels in the pits, where the pan has been broken through, the impeding influence of the pan itself has been removed and for that reason the pits may have a lower water level than that of the surrounding soil. Indeed, at times water has been seen running into the pits from the soil around at a level above that seen in the pit. This may have introduced inaccuracies in the table of water levels, but in my judgment these are but slight.

#### NATURE OF THE PEAT

The peat of the St. Ives Callunetum may be described as shallow, the usual depth being 7-8 cms. Among my measurements the maximum depth in any place was 10 cms. and the minimum 5.6 cms. As would perhaps be expected when the Ling is so uniform and flourishing, and the lichens and mosses so insignificant a part of the flora, the peat is composed almost entirely of the remains of Ling.

A block of peat was examined 5.5 cms. deep:

- (1) 1.7 cms. at the top showed Ling shoots both with and without flowers, roots, and an occasional piece of woody stem. These were distinguishable by the naked eye and very easily by a lens.
- (2) 1.8 cms. of black and much more compact material. A sample from the middle of this showed, under the microscope, (a) leaf epidermis marked by wavy epidermal walls and stomata, (b) branching rootlets.
- (3) 1.3 cms. not quite so deep a black because of a large number of sand grains.
- (4) .7 cms. a layer of sandy material bleached to a light chocolate grey. This layer had abundant roots in it.

There is thus no evidence of any plant remains other than Ling in this sample. No elaborate methods such as those needed for pollen analysis were employed.

#### LENGTH OF LIFE OF CALLUNA

It is well known that as the Ling plants get older they become more woody and have a smaller proportion of young green shoots. For this reason arises the common practice of burning. Regeneration occurs and the young plants form a better food for grouse and/or sheep. As the St. Ives Ling had not been burnt for over 20 years an opportunity arose of observing the length of life of the plants



in the conditions prevailing there. Dead stems of old plants were examined and cut across near the base. The sections examined under the microscope showed diameter and age as follows :

		Diam.	Age (rings)	Rate of Growth of Diam.
St. Ives.	1.	1.60 cms.	19 or 20	.80 mms. per annum.
	2.	1.30 cms.	15 or 16	.81 mms. „
	3.	.86 cms.	13	.66 mms. „
	4.	.86 cms.	12	.72 mms. „
Pen-y-ghent.	5.	1.70 cms.	27	.63 mms. „

The average age of these dead stems was 15 years. As they were typical dead stems taken at random, it may be concluded that in the conditions of St. Ives the average length of life is 15 years. I have a specimen from Pen-y-ghent which shows a considerably greater age and a slower rate of growth than at St. Ives. Both these may probably be correlated with the greater elevation from which the Pen-y-ghent specimen came. The old Ling becomes slightly tussocky with small spaces between the tussocks on which usually moss and lichen grow. The tussock stems in the dead or dying condition fall to a more horizontal position, thus opening the tussock out in the centre. Elgee (*Journal of Ecology*, II, 1914) observed that the space in the centre of the clump in the Cleveland area became colonised by *Hypnum* sp., *Cladonia* sp., and less often by *Juncus squarrosus*. At St. Ives I have seen nothing in a similar position in the old tussocks, but young Ling abundantly, occasionally young *Erica Tetralix*, and very occasionally *Eriophorum vaginatum* or a lichen. Thus the natural renewal here would seem to be mainly from seeds of the Ling.

It is hoped to deal with the effects of burning in a later report.

I wish to thank the Secretary and members of the Bradford Natural History and Microscopical Society for much willing help in collecting the data on which this report is based.

### HEATHER MOOR ECOLOGY, No. 3.

F. HEWSON, F.R.E.S.

#### LEPIDOPTERA REPORTS FROM ST. IVES, BINGLEY, FOR 1944-47.

1944.  
*Phragmatobia fuliginosa* L. The Ruby Tiger. A newly-spun cocoon was found on March 25th by Mr. J. Wood.  
*Anarta myrtilis* L. The Beautiful Yellow Underwing. Two noted on the wing on June 3rd.  
*Eupithecia nanata* Hb. Narrow-winged Pug. One taken on the wing, June 3rd.  
*Ceramica pisi* L. The Broom Moth. One larva found feeding on Bracken on September 16th. Not an uncommon find. This species feeds on almost any plant.  
*Ematurga atomaria* L. Common Heath. Imagines extremely abundant on May 28th. Normal.  
*Lasiocampa quercus* L. var. *callunae* Palmer. The Northern Eggar. I found eighteen larvae on April 29th and two on May 28th. Other members have spoken of seeing a number of these, but I have not heard of any cocoons or imagines being found. This is exactly the opposite of last year. We know that the species has a two-year life-cycle, but we expect the series to overlap and insects to be found in all stages each year. This species is the one which must here be the chief study of the Lepidopterist. The numbers should be noted, especially in the larval stage. Any narrow-waisted fly which may be an ichneumon, should be watched to see if it approaches larvae, or if it appears more interested in heather stalks or the ground beneath. I shall be grateful if members will examine larvae and either rear or let me have any which they find with a 'nipped' appearance on the ninth or tenth segment. This distinct narrowing of the body I suspect is a sign that the larva is parasitised. In this connection it should be remembered that an ichneumon fly from Northern Eggar at St. Ives was recorded by Mr. Hincks as probably new to Yorkshire. (See first report, *Nat.*, 1945.)

1945.  
 The long expected Emperor, *Saturnia pavonia* L., turned up with three larvae on July 7th. I took two Chevron Moths, *Lygris testata* L., and the other newcomer is

the Angle Shades Moth, *Phlogophora meticulosa* L., of which G. Flett showed me a newly-emerged specimen on September 8th, saying that there were many more at the far side, the western part, of the plot.

*Plusia gamma* L., the Silver Y Moth, which has been so common in all districts round Bradford, was at St. Ives in good numbers on September 8th.

Larvae of the Beautiful Yellow Underwing, *Anarta myrtilli* L., were in their usual moderate numbers, while larvae of the Broom Moth, *Ceramica pisi* L., were more common than usual.

1946.

The finding of a larva of *Apatele menyanthidis* Vieweg, the Light Knotgrass, on September 7th, brings the total of species up to seventeen.

Four imagines of *Dyscia fagaria* Thunb., the Grey Scalloped Bar, were noted on June 15th, a few males of *Ematurga atomaria* L., the Common Heath Moth, were noted on April 27th, and a dozen or so on June 15th.

Larvae of *Lasiocampa quercus* L. var. *callunae* Palmer, the Northern Eggar Moth, were picked up on April 27th (3), July 13th (2), and September 7th (17).

1947.

Painted Lady Butterflies *Vanessa cardui* L. noted on August 23rd, give an additional species, making eighteen.

The most interesting event has been the breeding of two varieties of *Lasiocampa quercus* L. var. *callunae* Palmer from larvae found on September 7th, 1946. On June 11th, 1947, I found in the puparium a female imago, which was darker than the type, being intermediate between male and female coloration. On July 16th a female of the variety *olivaceo-fasciata* Cock. emerged. The larvae had been slightly darker than usual, though not so dark as two found on Rombalds Moor in 1944 by G. Flett, one of which also produced an *olivaceo-fasciata*.

NOTE BY A.M.S. BASED, AS FAR AS ST. IVES IS CONCERNED, ON INFORMATION  
FURNISHED BY F. HEWSON

[It may be interesting to compare this list of Lepidoptera with one furnished by O. W. Richards from Oxshott Heath, Surrey (Richards, *Journal of Ecology*, 14 (2), 1926), a heath which was recovering from burning.]

Against a total of eighteen species recorded from St. Ives, Richards has a record of twenty-five species from the Ling of Oxshott, a southern heath. Interest centres in the fact that there are only five species common to the two lists and in one of these, *Lasiocampa quercus* L., the southern heath showed the species while St. Ives showed only the northern variety *callunae* Palmer. The other four species found in both north and south are *Anarta myrtilli* L., *Eupithecia nanata* Hb., *Ematurgia atomaria* L. and *Plusia gamma* L.

The larvae of *Lasiocampa quercus* v. *callunae*, of *Anarta myrtilli*, *Eupithecia nanata* and *Ematurgia atomaria* feed on Ling, while the adult *Plusia gamma* is a well-known visitor to *Calluna* flowers.

Other species whose larvae feed on Ling in the St. Ives list are *Saturnia pavonia* L. and *Dyscia fagaria* Thunb. Occasional feeders on Ling or Heather are *Ceramica pisi* L. and *Apatele* (*Acronycta*) *menyanthidis* Vieweg. These four are not found in the southern list.

Larval Ling feeders found only in the southern list are *Amphisbatis incongruella* Stt., *Aristotelia ericinella* Dup., *Coleophora juncicolella* Stt., *Gelecia ericetella* Hb., *Salebria palumbella* F. and *Scythris variella* Sph.

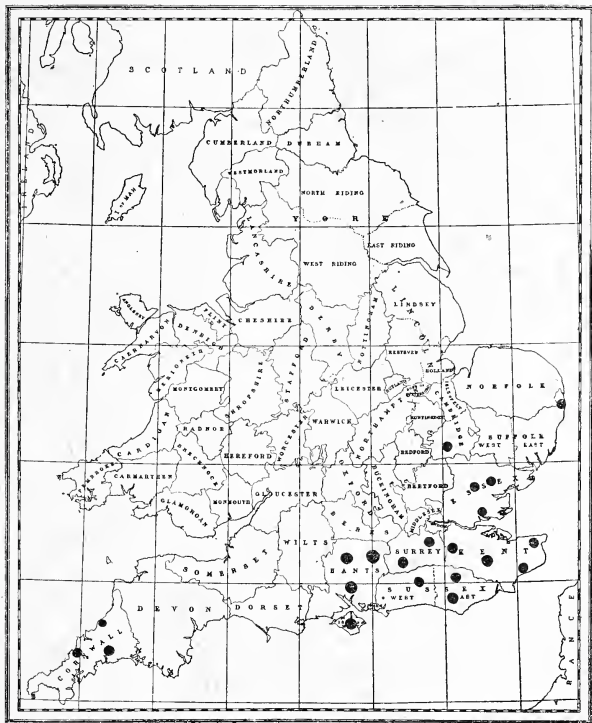
On the whole the Lepidoptera do not play at all a large part in the Callunetum, whether in the north or the south. At St. Ives the five butterflies *Pieris brassicae* L., *Pieris napi* L., *Vanessa atalanta* L., *Vanessa cardui* L. and *Lycaena phlaeas* L. may be regarded as mere passers-by, as they do not habitually visit Ling. Of the species which are Ling-feeders, none are sufficiently abundant to affect the plant appreciably.]

Other references to the insects found at St. Ives are included in the Annual Reports of the Ecological Committee for 1944, 1945 and 1946, the additional matter there particularly referring to Mr. Hincks' work on the heather beetle (*Lochmaea saturalis*).

# AN EXTENSION OF THE DISTRIBUTION OF THE SEROTINE BAT (*EPTESICUS SEROTINUS* SCHREBER) IN GREAT BRITAIN

K. F. BURTSAL AND D. L. HARRISON

ON the 26th of July, 1947, we collected an example of this bat in the grounds of Tyrell's Hall, Shepreth, Cambridgeshire. The specimen, which is now preserved in the collection of Mr. D. L. Harrison, is an adult male. When first seen it was flying low over a meadow and small stream in the angle between two lines of trees. Its large size, broad wings and heavy flight were at once apparent. It was silent on the wing but made a very loud squeaking when handled. No other examples



were seen in the vicinity. It is a large individual (wing span 370 mms.) and has none of the conspicuous golden tipping to the brown fur of the dorsal region so often seen in this species.

This record extends the known distribution of the Serotine in Britain. It is known to be locally abundant in Kent, Surrey, Sussex and Hampshire, including the Isle of Wight. West of Hampshire it has not been much noticed, but Barrett-Hamilton listed four localities in Cornwall. North of the Thames it is known in Essex from three records due to Miller-Christy. One was taken in August, 1906, at Pitsea, near Tilbury, one in 1894 at Broomfield and one killed before 1863 at Coggeshall. This last was the most northerly certain record known to Barrett-Hamilton when he wrote his *History of British Mammals*. In 1926, Ticehurst was able to record the Serotine as occurring at Lowestoft in Suffolk. He had seen some there six years before and the specimen, with a broken wing, was picked up at the same place. From his description there can be no doubt that this was a Serotine.

A more extended picture of the distribution of this bat is thus being obtained, but its presence in many counties has not yet been detected. It is without doubt

very rare in Cambridgeshire and this may be due to the unsuitable nature of most of the countryside or perhaps to the fact that this may be the northern fringe of its range in Great Britain.

The distribution map given shows the approximate location of actual records in Suffolk, Essex, Cambridgeshire and Cornwall while the points plotted in other counties merely indicate areas in which the species is known to be locally abundant.

Since this was sent to press we are able to add a further record. Mr. Burtal obtained a Serotine at Wendens Ambo, North Essex, on the 9th August, 1947.

ACKNOWLEDGEMENTS.—We are most indebted to Mrs. W. N. Woodham, of Shepreth, who kindly gave us permission to investigate the local bats and also to Mr. J. F. Higgins, whose assistance on this and many other occasions has been invaluable.

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### AN OCCURRENCE OF THE WHISKERED BAT (*MYOTIS MYSTACINUS* KUHL.) IN NORFOLK

D. E. SERGEANT AND D. L. HARRISON

ON the 24th of March, 1947, one of us (D.E.S.) visited Grimes Graves, the Neolithic flint mines near Brandon, Suffolk, to see if any bats were using it as a retreat.

A colony of fifteen bats was found and one of these was taken for identification. It proved to be an example of *Myotis mystacinus*. The others were similar, and almost certainly all were Whiskered Bats. The specimen is preserved in the collection of Mr. D. L. Harrison.

The bats were all found hibernating singly or in pairs on the chalk walls of the main shaft of the excavated pit, this apparently being a drier situation than any in the galleries of the pit. The bats were not entirely torpid.

On the 18th of May we again visited Grimes Graves in company with Mr. J. L. Chaworth-Musters and Mr. J. F. Higgins, but this time no trace of the bats themselves could be found, although their excreta were present on the floor of the main shaft. Either they had retreated into some inaccessible crevices in the galleries, or they had found means of leaving the mine during the summer. The hatch closing the pit is kept locked, except when visitors are shown round, and there is no other possible exit visible. (According to the custodian, the bats are to be seen flying inside the pit on summer evenings, and do not leave it.)

It is interesting that fossil remains of this bat were found during the excavation of this pit and the adjoining one,<sup>1</sup> so that the species was present in Neolithic times. All the mines became filled with debris in the course of time and remained so till these two were excavated in recent years. It is therefore probable that the recolonisation by *M. mystacinus* is a recent one.

Although of wide distribution in most of Great Britain, the Whiskered Bat is extremely rare in East Anglia. It has occurred rarely in Cambridgeshire,<sup>2 3 4</sup> but is not known from Lincolnshire, Suffolk or Norfolk hitherto.<sup>5</sup>

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## FROM A MICROSCOPIST'S NOTEBOOK

W. LAWRENCE SCHROEDER, M.A.

FROM time to time I find myself questioning the utility of various phases of scientific activity. Why should people compile lists of animals and plants found in this place or that, or trouble to note when this flower opened or that bird appeared! Why should I, for example, collect material from this ditch or that trough, and note the presence of this diatom or that ciliate, patiently measuring the breadth of a *Spirogyra* filament, or estimating the frequency of the green *Paramoecium-Bursaria vernalis*! Well, one answer is clear, folks who indulge in this particular sort of activity must like the job, or, at least, realise that the results of their work may be useful to someone or other, although in what particular way they may know not.

In my more philosophic moments, my questioning of scientific method is considerably modified: for it is on the detailed examination of individual elements and processes, and the setting of these in relationships on various levels of inquiry, that science proper proceeds. So the spatial and temporal relations of organic and inorganic are fundamental in the knowledge of the universe, and the function of the mere enumerator of individual facts in their immediate connection with a specific environment is abundantly justified, in that his work may be basal to the larger handling of related bodies of fact, and to the determination of specific sequences of vital and material activity. With this thought I feel happier in presenting another batch of notes, apparently disconnected, and yet with a unity, apparent not only in my individual interest, but also in the nature of the environment concerned, and in the method of examination.

Hitherto my notes have been mainly of material collected in Yorkshire—the Bramley ponds being the happiest of my hunting grounds. But since my settlement in the south of the Isle of Man my operational field has been definitely circumscribed: for ponds are few and very far between, and I have to rely in the collection of 'pond-life' on troughs, roadside runnels, wells, and streams; most of the rivers run too swiftly to be of much use for my specific purpose, but here and there, and now and then, there may be quiet little harbours not greatly disturbed by the main body of the river, where choice objects may be taken. So, from the side of some steps which led to the river, I have taken crane-fly larvae, and one of the most beautiful of rotifers, *Floscularia campanulata*, with its five lobes, from each of which stream bunches of long cilia—about fifty on each lobe—which against a black back-ground is a moving vision of beauty. The creature lives in a rather untidy gelatinous case, into which it retires with amazing swiftness when disturbed. A tidy case might not be seen, as it is supposed to be of the same refractive index as water; but plant debris will adhere in time, and then the outline can be discerned. The cilia, bunched as the lobes unfold, are about 160 micra long and spring from the entire top of the lobe: when extended they seem less, for the distal ends are apparently lost in the water, but the current set up when they are active is relatively strong, for 'spores' were quickly and surely engulfed. The material was collected on 24th July, and the rotifer was seen on 7th October on a filament of *Vaucheria*. The length of the body was 152 micra. Within the mouth cavity were about 15 'spores' and unicellular algae; the mastax could not be seen, but it must have been in operation, since the food material passed from the vestibulum through the esophageal tube into the proventriculus. At the lower end of the body was an oval egg, 56 micra long and 36 micra wide, which, on the following day, had moved lower to the stalk. When the rotifer retracts, the stalk goes into rings, much as does the longer stalk of the *Vorticella*—that is longer relatively to the body of the creature; the stalk of the rotifer was 270 micra long. In the same collection and with the Floscule, was a rather rare rotifer, *Oecistes brevis*, also living in a somewhat untidy case. The almost circular corona was edged with cilia; in the centre was the mouth and immediately below was the mastax or gizzard, which worked quickly and jerkily. The beats were about 100 to the minute: 12 beats would regularly occur, then there would be a slight pause, followed by another quick dozen. The entire length of the creature, including a somewhat stumpy stalk, was about 108 micra, for the body, plus 36 micra for the stalk.

From a mere roadside runnel I took a *Rotifer vulgaris*, exceedingly thin when extended, and whose length was about 576 micra: and a nearby well gave me,

on 25th August, *Floscularia proboscidea*, the edge of whose disc is beaded. It was on a filament of *Oedogonium*.

But the most amazing sight vouchsafed me in my observations of the wheel animalcules was of one rotifer swallowing another. I took the creatures from a bowl of various mosses, which were well supplied with water. One of the rotifers—a *Distyla inermis*—was twice the size of the one attacked. On the part of the bigger rotifer there was great excitement and activity as it drew near to the smaller creature. For over ten minutes there were feints and manoeuvrings, but at last the smaller one was seized at the anterior end, its two toes waving wildly in the water. The *Distyla* did not anchor itself by its toes; for the greater time they were wide apart. But, so quickly, that it was hard to discern how it had happened, the smaller rotifer was half engulfed, and then with another quick movement it was well inside, and quite distinctly to be seen. The combination moved away into the surrounding moss, and I was unable to follow further the development. It is unlikely that the one rotifer might serve as food for the other, and I have wondered whether the conduct was part of the method of reproduction. Certainly it was a case of two becoming one.

Very common in this part of the world is the rotifer *Philodina roseola*—the very name is musical. It is like the common *Rotifer vulgaris*. It differs in the position of the two eyes which in the latter are on the proboscis, and in *Philodina*, one-third of the way down the body. I took *P. roseola* from a roadside runnel on 1st April: the collection was very satisfying. A setting out of what was taken will give some idea of what may be found by the roadside. The desmid *Closterium lanceolatum* was in number: they gathered together at the edge of the dish. Of diatoms there were *Surirella ovalis* var. *minuta*, *Meridion circulare*, *Pinnularia viridis*, *Navicula salinarum*, *N. anglica* and *N. cincta* var. *Heusleri*. There was a species of *Oscillatoria*, two species of *Ulothrix*—*U. variabilis* and *U. tenuissima*—and a species of *Mougeotia*.

Animal life was profuse: *Amoeba guttula*, with the contractile vacuole quite clear in its working; the Sun animalcule, *Actinophrys Sol*; *Bodo ovatus*, with the trailing flagellum; *Peranema trichophorum*, in number; and the ciliates *Chaenias teres*, *Chilodon cucullulus*, *Loxodes rostrum*; the handsome *Nassula ornata* and a *Euplotes* in division. *Euglena viridis* was also in the crowd, but the *Philodina* was the handsomest of the bunch. As the two ciliated lobes were functioning, two *Euglenae* were caught in the current set up by the moving cilia. They were too big to be swallowed by the rotifer; they were drawn towards the mouth and then shot off into watery space, only to be caught again and again by the current. Finally, one of them slipped down the side of the rotifer, and went rolling off, doubtless in considerable satisfaction. The other sent off with a greater impulse found itself in quieter waters and so escaped.

Another *Philodina*, finding itself in a mass of vegetable debris, so that the working of the ciliated lobes was impeded, shoved the debris to one side, and then not finding that satisfactory, turned to a clearer space.

Rotifers feed on unicellular algae, and on minute portions of vegetable material that may be part of disintegrated plant life; spores are often ingested. I watched a *Philodina* feeding on *Chlorella vulgaris*. The algae were drawn by the current to the mouth, and the mastax in operation, passed it straightway into the stomach. Nine of the algae, none the worse apparently for their passage into a strange interior, seemed as green and as fresh as when free; but towards the posterior of the rotifer, there was an agglutinated bunch of partially-digested *Chlorella*, looking much the worse for their enforced acquaintance with a superior being.

From time to time, and almost in any month of the year, developing embryos of rotifers may be found; if fortune favours the observer, he may see the rotifer emerge. I kept one under observation on 13th May for hours. The egg-case was attached by a slight stalk to an algal filament, and the creature moved freely within the case, the ciliated lobes in constant activity against the interior of the shell. Twenty-one hours later the rotifer was still in motion, the lower part of the body being the more active. Apparently it emerged during the night of 14th May. Its identity was not determined.

Almost any week I show microscopic stuff to more or less interested visitors. If asked what of pond life they wish to see, the almost invariable answer is *Amoeba*—that creature having been made popularly familiar by journalistic references to its position in the scale of life. I confess that I am never tired of

watching the slow apparently indeterminate movement of the creature over the slide. There are seven or eight quite definite species, and I have had at least five of them under observation from time to time. *A. limax* has a constant caudal appendage—a bunch of slender short pseudopodia. *A. verrucosa* is a lumpy individual with knob-like protuberances on its surface; the movement is slight, almost indiscernible. *Amoeba radiosa* (Ehrenb.), now named *Dactylosphaerium, radiosum* has long finger-like projections, which are fairly constant in shape. I saw one divide: the two main masses retained their circularity, each with two definite pseudopodia.

Another popular choice is *Vorticella*, the Bell animalculum, which may be found at times in great number, covering the algae to which it may be attached, as a thin grey cloud. The stalk contracts in close rings. At times a *Vorticella* may detach itself from the stalk, and develop a ring of cilia, at the lower end of the body. A near-by trough, with an imperceptible inflow and outflow, and with a mass of dead leaves at the bottom, has furnished me with an abundance of infusorial life, *Vorticella* predominating during the greater part of the year. One dip furnished a slide with interesting specimens; one with three contractile vacuoles, another with the posterior ring of cilia, and a third with a microconjugant burrowing into the lower part of the body—illustrative of sexual differentiation. The vacuoles contracted every six seconds, one merging into another from time to time. Another creature with disc cilia 18 micra long, had been exceedingly active; it had ingested about 24 small unicellular algae. Sometimes the trough is covered with a film of *Pleurococcus* and *Chlorella*, oxygen bubbles giving it a lumpy appearance. Invariably numbers of *Vorticellae* may be found in the film; I have had 20 of the animalculum in the field of the microscope at one time, together with many ciliates; quantities of *Cyclidium glaucoma*, which has a side-net for the catching of prey; numbers of a larger ciliate—26 micra by 18 micra—*Cinetochilum margaritaceum*, and several very small Sun animalcula—the *Actinophrys Sol*—about 18 micra in diameter.

I allowed the dish of material to dry, and after three days I poured fresh water on the stuff; in about eight hours the material was as lively as before, with a number of very fussy *Monas* in evidence. Nine days later I dried the stuff, and in due course re-watered it, but the ciliates had disappeared, apparently tired of the trick.

The trough mentioned is a great standby when my jars of material are not profuse of life, for at almost any season of the year I can take what may interest any intelligent visitor to my study. Indeed, the trough demands an article all to itself.

## BOOK REVIEW

**They Live in the Sea**, by Douglas P. Wilson. Pp. 128, with 90 photographic illustrations. Collins, 12/6. Douglas Wilson, Zoologist at the Marine Biological Laboratory at Plymouth, has long been known to us as an expert on the life in our coastal waters and as a photographer of high skill and discrimination. Only an expert in both of these fields could possibly produce such a book. The photographs are indeed superb; the animals come alive as one looks at the pictures. The reading matter merely explains the photographs but loses nothing of its charm in so doing. To marine naturalists, both amateur and professional, preserved and contracted specimens are much more familiar than the living animal. The pictures in this book of glistening sponges, lovely anemones with snaking tentacles, expanded corals, and fan worms of gorgeous design create a delightful impression on the mind. Octopus eating crabs, and cuttlefish catching shrimps have a flavour of the sensational; whilst a young lumpsucker and a spotted-ray are pictures of arresting artistic quality, even in a book full of such. The text deals with the various natural orders of marine life in a way easily to be understood by the lay reader, with due emphasis on the more interesting aspects of the natural history of the animals depicted. A chapter on 'Shore Work' cannot do other than interest all readers. The author has certainly achieved his aim of bringing marine natural history to the amateur, and providing a delightful introduction for the young naturalist. The best compliment we can offer the publishers is to say that the production of the book is in every way worthy of Collins.—H. H.

## THE LADY-BIRDS OF KEIGHLEY

E. G. BAYFORD, F.R.E.S.

IN October, 1946, Mr. J. Wood, of Keighley, sent me a number of Lady-birds which he had collected during the year in the Keighley district.

At the time I was laid aside and could not deal with them more than to admire Mr. Wood's superb mounting. Lady-birds are amongst beetles most difficult to set fully and symmetrically: indeed Canon Fowler recognising this suggested the setting out one side only as sufficient, yet Mr. Wood's success is almost flawless.

When at last I was able to examine them I found much that was worthy of being placed on record. The year 1946 was a poor year so far as insect collecting was concerned so that the absence of some species that are almost certain to occur in the Keighley district is not surprising. The following is a complete list of species and their aberrations with notes where necessary.

*Adalia 10-punctata* L. Of this very variable species, the following aberrations occurred; the type form was not present.

*dorso-notata* Weise.  
*4-punctata* L.  
*trigemina* Weise.  
*8-punctata* Müll..  
*consita* Weise  
*12-punctata* Müll.  
*centro-maculata* Weise.  
*semi-fasciata* Weise.  
*obliquata* Reiche.  
*humeralis* Schall.  
*limbella* Weise.  
*bimaculata* Pont.

*A. bipunctata* L. Type form not present, but represented by the aberrations  
*4-maculata* Scop.  
*lugubris* Weise.

*Coccinella 7-punctata* L.

*C. hieroglyphica* L. Type not present, all the specimens belonging to the ab.:  
*lineolata* Marsh.

*Calvia 14-guttata* L.

*Paramysia oblongoguttata* L.

*Anatis ocellata* L. This is a most interesting series. All the specimens lack the pale rim to each black spot from which the species gets its name. This appears to be the dominant form in Yorkshire as I have not seen a typical form from our county. In addition to this the general ground colour is darker, in some cases very much so, and in two of the specimens the thorax is entirely black, with the elytral pattern as in ab.: *quindecim punctata* Degeer.

One specimen has spots 5, 6, 7, 8 much reduced in size and another has the longitudinal scutellary spot (2) prolonged to unite with 6, making a pleasing design.

*Thea 22-punctata* L.

*Chilocorus bipustulatus* L.

I am grateful to Mr. Wood for the pleasure of examining this interesting series of these pretty and useful beetles.

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*Rhyssa persuasoria* L. near **Barnsley**.—On June 24th a female example of this very local ichneumon was brought to me. It had been found at rest on the window of a house in Darfield about three weeks before. Despite the frequent handling during this period the specimen was in good condition and perfect, but of course needed relaxing before it could be set. It is one of the largest I have seen having an expanse of wings of 2 inches, and measuring  $1\frac{3}{4}$  inches from head to anal extremity. Length of terebra 2 inches.—E. G. BAYFORD.



## PLANT NOTES AND RECORDS

*Orchis militaris* L.—It is about 35 years since the last evidence of the continued existence of the Soldier Orchid as a British plant and Druce's statement in the *Comital Flora* that it was 'nearly, if not quite, extinct' has seemed more likely to be true in the second alternative than the first. The discovery of a fine colony in Buckinghamshire, v.c. 24, just coming into flower on May 25th, 1947, is therefore of considerable interest.

On revisiting the plants six days later for the purpose of taking a series of colour and monochrome photographs I found the spikes fully expanded and more numerous than at first estimated. On both occasions sketch maps were prepared of the position of the orchids of which over 40 flowering and barren plants were seen. A considerable time was spent in making ecological observations with a view to offering possible explanations of the disappearance and reappearance of the species, and these notes will form the basis of a paper now in preparation. In the meanwhile it seems advisable to place the discovery on record in the hope that botanists with any information about the species both in Britain and abroad will place it at the writer's disposal. Records of its occurrence during the present century will be especially welcome and lists of material preserved in public and private herbaria appreciated.—J. E. LOUSLEY.

*Epipactis atropurpurea* Raf. in the Ripon District.—The discovery of a single plant of this rare orchid on the recent meeting of the Y.N.U. at Burton Leonard is of more than passing interest. F. A. Lees in the *Flora of West Yorkshire*, gives a number of stations in the Ribbles, Lune and Aire drainage areas, with one in brackets for the Yore, as follows :—(near Ripon : O. A. Moore—an error?). This record is also given in J. G. Baker's supplement (1854) to Baines *Flora of Yorkshire*. Here the locality is given as Mackershaw Woods near Ripon, and also at Nosterfield lime kilns. The last named is in the North Riding. There seem to be no further records of the occurrence of this species in either of the stations named, and there is no mention of it in Slater's *Flora of Ripon* dated 1883.

The Burton Leonard station was on the edge of one of the old quarries in the magnesian limestone, very near the road. The fact that the district is well worked botanically rather points to the plant being erratic in its appearances, and the possibility of it only flowering in favourable seasons would account for its being overlooked in the past. Mackershaw and Nosterfield are on the magnesian limestone and at both places there is ground where the plant might well occur. Any information regarding it would be very welcome, also recent records of its occurrence in the Red Scar, Downholme, and Copperthwaite districts of Swaledale from where Baker records it in *North Yorkshire*.—CATHERINE ROB.

*Epilobium pedunculare* A. Cunn.—On a recent visit to the Black Force beck on the Yorkshire-Westmorland boundary, I was astonished to see how this plant has colonised the whole length of the stream sides, from the Force to the Lune, a distance of some two miles. It was possibly 1940 when I last visited the area and the plant was not seen then. Other species of the genus are fairly plentiful, such as *E. alsinifolium*, *palustre* and *montanum*, but at the end of August it was *E. pedunculare* that caught one's eye along the whole length of the stream and it is now the most plentiful species. It is evidently a plant to be watched wherever it gets a foothold. I remember being surprised to see it up Uldale about 1940, but here Dr. Frankland had a house and garden where it might have been introduced. The station on the stream was a mile or so upstream and east. Black Force is on the west of the Cautley mountain mass and five or six miles away as the crow flies (or the seed blows), but this is possibly the source from which the Black Force plants came and the situation is evidently exactly right for the species.—CHRIS. A. CHEETHAM.

This creeping New Zealand willow-herb is becoming increasingly common and spreading rapidly wherever it gets a foothold. Its apparent preference for the wilder places amongst the hills and moorlands is perhaps due to the rocky stream sides and beds affording a more open habitat where it is better able to compete with existing vegetation than it is with the taller and closer-growing plants of the lowlands. Once established in such moist, stony ground, it is more than able to hold its own and spreads aggressively.

In June of this year, I saw it in considerable quantity by a stream flowing down to Thirlmere from Helvellyn and traced it upwards to about 1,200 ft. It is abundant on wet rocks by the road at the head of Haweswater, where it may have originated from one of the now submerged Mardale village gardens, and it occurs in other places in the Lake District. In *The Naturalist*, 1944, p. 144, I recorded it from a stream side high on Widdale Fell, above the railway from Ribbleshead to Dent, and I have seen it at Hackness and had specimens sent from Egton Bridge and from Scotland. In July, 1941, I followed up the stream from the Lune to the Black Force but, like Mr. Cheetham, I saw no sign of the plant then.

In the first edition of Druce's *British Plant List* (1908) the only alien willow-herb listed is *E. nummularifolium* R. Cunn., and although *E. pedunculare* A. Cunn. and *E. alsinoides* A. Cunn. were added to the second edition (1928) the first name has gained currency and been applied to plants which I suspect are in most cases *E. pedunculare*. I have been interested in the occurrence of this plant for some years and have exchanged specimens and letters about it with Dr. H. H. Allan, of Wellington, N.Z., who has confirmed my identifications of all my gatherings as *E. pedunculare*. Although *E. nummularifolium*, which can best be distinguished from it by its pubescent capsules, is an equally common species in New Zealand, I have yet to see a specimen of it from this country.

The inclusion of *E. nummularifolium* in *Suppl. Yorks. Floras* was based on records under this name of garden weeds at Elmete Hall, Roundhay, and Grey Gables, Calverley. I have specimens of the Elmete Hall plant collected by the late A. E. Bradley in 1908 and these, too, are *E. pedunculare*. Lees also states that 'the Roundhay growth is the var. *pedunculare*' and adds that 'it has already, 1910, spread down the waterway to the Roundhay brook which carries the effluent from the Elmete enclosure.'

In *Rep. B.E.C.*, 1945, p. 58 (1947), Mr. Brenan records *E. pedunculare* from the lower part of Tilberthwaite Gill (where I also saw it in June of this year) and from between Grasmere and Thirlmere, adding, rightly I am convinced, that the records for *E. nummularifolium* in Wilson's *Flora of Westmorland* should, until confirmed, be looked upon with suspicion as referring in all probability to *E. pedunculare*.

I should be very glad to see specimens of any gathering considered to be the true *E. nummularifolium*.—W. A. SLEDGE.

Since this note was written I have received another record from a stream side "on the moors of the North Riding between Blue Bank, Sleights, and Goathland," where it was found in August by Mr. T. Cockerline, and identified by Mr. A. J. Wilmott.—W.A.S.

***Monotropa Hypopitys* L. near Masham.**—On July 20th, 1947, near Quarry Gill, Masham, Mr. R. Chislett showed me a group of plants growing under beeches, which at first glance some ten days previously he had thought to be an abnormal *Lathraea squamaria* L. flowering at a very unusual date, then had doubted it. I took a specimen for submission to Kew who have named it *Monotropa Hypopitys* L. (Yellow Bird's-nest). Baker's *North Yorkshire* only gives two localities for the species, viz., near Kirklington and near Thornton-le-dale.—JOYCE RIDGWAY.

[It still grows in Thornton-le-dale and also in Forge Valley, *vide Nat.*, 1947, 23.—ED.]

***Limonium* spp.**—The assistance of botanists is requested by Dr. H. G. Baker, of the Botany Department, The University, Leeds, in determining the relative importance of reproduction by seed and by vegetative means of species of *Limonium* (*Statice*) in this country. Information concerning *Limonium binervosum* C.E.S., *L. transwallianum* Pugsley, *L. paradoxum* Pugsley and *L. recurvum* C.E.S. in particular will be welcomed and it is especially desired to ascertain whether the cultivation of these species from seed has ever been attempted.

**The Hepatic, *Anthoceros laevis* L. in Yorkshire.**—When botanising with Miss C. M. Rob, F.L.S., near Ingleby Greenhow in August last I came across a fine growth of *Anthoceros laevis* L. It was associated with *Blasia pusilla* L. and *Fossombronina Wondraczeki* (Corda) Dum., and not far away, on the same damp trackside bank, was a fine show of *Marchantia polymorpha* L. with the ripe spore mass of the capsules quite noticeable. The *Anthoceros* was bearing many ripe

sporogonia, and shed yellow spores could easily be seen on the thalli without the aid of a lens. Some specimens will be distributed through the British Bryological Society next winter.

This gathering appears to represent a new county record for North-east Yorkshire, V.C. 62, but on checking my annotated copy of the *Census Catalogue of British Hepatics* (3rd Edition, 1930) with F. E. Milsom's list of Yorkshire Hepatics in *Trans. Y.N.U.*, Part 37 (1946) some discrepancies have been discovered. The record of *A. laevis* L. for Rose Wood near Sheffield (Amos Carr, 1876) given by Lees in his *Flora of West Yorkshire*, 628, and repeated by Milsom, has been overlooked for V.C. 63 by the compilers of all three editions of the *Census Catalogue*. Possibly this record was not considered reliable; of that I have no knowledge.

Similarly, a record of *A. punctatus* L. given by Lees for V.C. 64 in his *Flora of West Yorkshire*, and quoted by Milsom, is also omitted in the *Census Catalogue*. It is desirable, therefore, that the several British species of *Anthoceros* be specially looked for in Yorkshire, and an effort made by resident bryologists to confirm the old records. The two better known species, *A. punctatus* and *A. laevis* range to Caithness in Scotland, so should occur in many parts of such a varied county as Yorkshire.—E. C. WALLACE.

**Some Notes on Mosses**—When riding to the Whitsuntide Y.N.U. meeting at Scotch Corner I noticed a large amount of a species of moss that I only find in small quantity in Yorkshire, *Antitrichia curtipendula* Brid. This was on the wall on the roadside between Askrigg and Carperby and with it was *Leucodon sciuroides* Schwaeg. I have previously noted the latter as plentiful in Wensleydale. The occurrence of *Orthodontium gracile* Schwaeg., var., *heterocarpa* Wats. was noted at Scarborough in 1943 and we found it at Forcett Park which is close to the Durham boundary. These records extend Burrell's area given in the 1940 *Naturalist*. Recently, when visiting Malham Tarn Bog with Dr. Sledge to gather *Camptothecium nitens* Schpr., we saw the *Orthodontium* growing up the bases of tussocks of sedges. When the plant is better known it will be found to be widespread. Whilst on Malham Moor we tried unsuccessfully to find *Thuidium Blandovii* B. & S. A swamp just south of the Tarn seems a hopeful place and here a form of *Amblystegium filicinum* De Not. is very abundant with a little *Hypnum commutatum* Hedw. and *H. revolvens* Schawtz. This swamp is a place where we find *Cinclidium stygium* Swartz growing near to *Mnium subglobosum* B. & S. Our walk took us on to Parson's Pulpit, 1765 ft. O.D., where we saw plenty of *Pseudoleskea catenulata* B. & S., and in crevices of limestone rocks *Mnium orthorrhynchum* B. & S. was plentiful. Recently I noticed a small springhead on Thieves Moss, Austwick, 1200 ft. O.D., which was a bright, light-green colour when the moss growing there was young. It was less yellow than the usual *Philonotis* of these places and on examination I found it a form of *Mnium affine* Bland. which agrees with var. *rugicum* Laur. A description of this was given by L. Loeski in the *Brit. Bryol. Soc. Report* for 1927.

Shortly after the snow cleared away around Austwick Moss, on the mounds of soil excavated during the drainage operations there was a striking show of fruiting *Physcomitrium pyriforme* Brid. and *Funaria hygrometrica* Sibth. At this time grasses and other plants had not made much growth and the mosses were easily seen. The large amount of *Physcomitrium* at once attracted attention but at the end of June the plant could not be found; the *Funaria* however was still producing new fruits and was easily seen.

Two species of *Splachnum* have been more plentiful than usual this year. *S. sphaericum* L. being abundant along the line of Sulber Nick near where it crosses the track from Selside to Clapham. *S. ampullaceum* L. was seen on the bog in Wharfe Wood, Austwick, and on the Moss; both species have made better growth and are taller plants than they are normally.

*Anactangium compactum* Schwaeg. has a curious distribution in Yorkshire. There is a fair quantity in a limited space on Ingleborough, more up Cautley Spout, then a large amount, often fruiting, up the Rawthey above Uldale House. Recently I found it plentiful down the stream from Black Force to the Lune. These two stations do not seem much different to similar streams in the upper parts of the dales, but the moss finds some difference.—CHRIS. A. CHEETHAM

## THE SPRING FORAY AT THORNTON-LE-DALE

April 10th-14th, 1947

W. G. BRAMLEY

THE Spring Foray continues in popularity and some 20 members and friends again assembled round Miss Maidment's hospitable board. One day was devoted to an excursion to Forge Valley the remainder more or less covering the ground worked the previous year with Howdale receiving the most attention. As usual the hewers of wood were again to the fore but some of the newer members were inclined to pursue their own investigations at the same time taking an interest in the collecting of others.

A pleasing feature of the workroom was the provision by the I.M.I. group of a series of specimens illustrated by details of structure of two or three sections of Pyrenomycetes. These were of great help in showing the family affinities and giving beginners a foundation on which to build if their inclinations turned in the direction of this large order.

Although this area has been well worked previously several species new to Yorkshire were found and a *Corticium* found growing on mud in Forge Valley proves to be new to Britain.

Our thanks are due to the following for lists of fungi collected : Messrs. Mason, Hughes and Ellis, of the I.M.I. ; P. H. B. Talbot for Basidiomycetes ; I. Webster and C. F. Rimington for Discomycetes, and to all others for collecting and helping to make the foray successful.

P. = Pickering Beck.

F. = Forge Valley.

T. = Thornton Dale.

H. = Howdale.

\* = Not in Mason and Grainger.

† = Not in Mason and Grainger for V.V. 62.

‡ = New to Britain.

## ASCOMYCETES

## DISCOMYCETALES

- |  |   |
|--|---|
| <i>Calloria fusarioides</i> (Berk.) Fr., on    | <i>Lasiobolus equinus</i> (Muell.) Karst., T. |
| <i>Urtica</i> H.                               | <i>Lachnella sulphurea</i> (Pers.) Quél.,     |
| <i>Calycella claro-flava</i> (Grev.) Boud., H. | H.T.  |
| <i>Cheilymenia coprinaria</i> (Cke.) Boud.,    | <i>Mollisia cinerea</i> (Batsch) Fr.          |
| T.   | <i>M. dentata</i> (Pers.) Gill., F.           |
| <i>Chlorosplenium aeruginosum</i> (Oeder)      | <i>M. ligni</i> (Desm.) Karst., H. (M. & G.   |
| de Not., F.                                    | sub <i>M. lignicola</i> ).                    |
| <i>Ciboria amentacea</i> (Balb.) Fckl., F.     | <i>Sarcoscypha coccinea</i> (Jacq.) Fr., F.   |
| <i>Corynella atrovirens</i> (Pers.) Boud., H.  | <i>Trichoscypha calycina</i> (Schum.) Boud.,  |
| * <i>Dasyscypha cervina</i> (Pers.) Fckl., on  | H.  |
| <i>Fraxinus</i> H.                             | <i>T. subtilissima</i> (Cke.) Boud., on       |
| <i>D. virginea</i> (Batsch) Fckl., H.          | <i>Pinus</i> H.                               |
| <i>Helotium cyathoides</i> (Bull.) Karst.,     |   |
| T.   |   |

## PYRENOMYCETALES

- |   |  |
|---|--|
| <i>Anthostoma turgidum</i> (Pers. ex Fr.)       | <i>Cryptosphaeria eunomia</i> (Fr.) Fckl.,               |
| Nits., H.                                       | P.T.   |
| <i>Berlesiella nigerrima</i> (Blox. ex Curr.)   | <i>C. populina</i> (Pers.) Sacc., P.                     |
| Sacc., on <i>Diatrype stigma</i> on <i>Acer</i> | <i>Cryptosporella hypodermia</i> (Fr.) Sacc.,            |
| F.H. on <i>D. stigma</i> on <i>Corylus</i> H.   | F.   |
| <i>Bertia moriformis</i> (Tode ex Fr.) Sacc.,   | <i>Dialonectria sanguinea</i> (Bolt.) Cke.,              |
| H.  | on <i>Anthostoma</i> H.                                  |
| * <i>Botryosphaeria hoffmanni</i> v Hohn.,      | <i>Diaporthe leiphaemia</i> (Fr.) Sacc., on              |
| perithecia and pycnidia on <i>Fagus</i> , H.    | <i>Quercus</i> P.  |
| <i>Calospora platanoides</i> (Pers.) Niessl,    | * <i>D. pardalota</i> (Mont.) Fckl., on <i>Ilex</i> , H. |
| on <i>Acer</i> H.F.                             | <i>Diatrype disciformis</i> (Hoffm. ex Fr.)              |
| <i>Chaetomium elatum</i> Kunze & Schmedl.       | Fr., on <i>Fagus</i> , F.H.                              |
| ex Fr., on sacking, F.                          | <i>D. stigma</i> (Hoffm. ex Fr.) Fr., H.F.               |
| <i>Chaetosphaeria phaeostroma</i> (Dur. &       | <i>Diatrypella favacea</i> (Fr.) Ces. & de               |
| Mont.) Fckl., conidia on <i>Diatrype</i>        | Not., on <i>Fagus</i> , F.                               |
| <i>stigma</i> on <i>Acer</i> , F.               | <i>D. quercina</i> (Pers.) Nits., H.                     |



## PYRENOMYCETALES—Continued

- Dichaena quercina* (Pers.) Fr., H.  
 \**Ditopella ditopa* (Fr.) Schroet., on *Alnus*, F.  
 \**Eutypa flavovirens* (Fr.) Tul., on *Fagus* and *Corylus* H.F.  
 \**Eutypella sorbi* (Fr.) Sacc., on *S. aucuparia*, H.  
 \**Farlowiella carmichaeliana* (Berk.) Sacc., on *S. aucuparia* H. conidial on *Fagus* H.  
 \**Gloniopsis levantica* Rehm., on *Rosa* F.H. *Rubus* F.  
*Hypomyces aurantius* (Pers. ex Fr.) Tul., conidial H.  
*Hypoxylon coccineum* Bull., H.  
*H. fuscum* (Pers. ex Fr.) Fr., F.  
*H. multiforme* (Fr.) Fr., on *Betula* F. on *Alnus* T.  
*H. rubiginosum* (Pers. ex Fr.) Fr., on *Fraxinus* F.  
*H. semi-immersum* Nits., on rotten wood of *Quercus* H.  
*H. serpens* (Pers. ex Fr.) Fr., on *Betula* F.  
*Lasiosphaeria spermoides* (Hoffm. ex Fr.) Ces. & de Not., on *S. aucuparia* and *Fraxinus* H.  
 \**Lasiosphaeria strigosa* (A. & S. ex Fr.) Sacc., on *S. aucuparia* H.  
*Leptosphaeria acuta* (Hoffm.) Karst., H.T.  
*Lophodermium pinastri* (Schrad.) Chev., F.  
*Melanomma pulvis-pyrius* (Pers. ex Fr.) Fckl., on *Fagus* F.H.  
 \**Melanopsammella inaequalis* (Grove) v Hohn., on *Betula* F.  
 †*Nectria punicea* (Kunze & Schum. ex Fr.) Fr., on *Fagus* H.  
 \**N. wegeliana* Rehm., on *Diaporthe* sp. on *Tillia* F.  
*Nitschkia cupularis* (Pers. ex Fr.) Karst., on *Fraxinus* H.  
 †*Perisporium vulgare* Corda, on sacking F.  
 \**Peroneutypa heteracantha* (Sacc.) Berl., on *Tillia* F.  
*Pleospora herbarum* (Pers.) Rab., on Potato stems, H.  
*Rhopographus filicinus* (Fr.) Nits., on *Pteridium* F.  
*Rhytisma acerinum* (Pers.) Fr., H.F.T.  
*Sillia ferruginea* (Pers. ex Fr.) Karst., on *Corylus* F.

## BASIDIOMYCETES

- Acia uda*, (Fr.) Bourd. & Galz., H.  
*Auricularia auricula-judae* (L.) Schroet., T.H.  
*Corticium comedens* (Nees) Fr., on *Fagus* T.  
*C. confluens* Fr., on *Corylus*, *Quercus*, H.  
 †*C. laetum* Karst., on mud, F.  
*C. laeve* (Pers.) Quél., H.  
*C. sambuci* (Pers.) Fr., F.H.  
*Dacryomyces deliquescens* (Bull.) Duby, F.H.  
*Exidia glandulosa* (Bull.) Fr., H.  
 \**E. thurettiana* (Lév.) Fr., on *Fagus* H.  
*Fomes annosus* Fr., on Conifer H.  
*F. ferruginosa* (Schrad.) Mass., H.  
*Hymenochaete corrugata* (Fr.) Lév., H.  
*Hypholoma capnoides* Fr., on Conifer H.  
*Lycoperdon perlatum* Pers., (old) H.  
*Mycocleptodon fimbriatum* (Pers.) Bourd., F.H.  
 \**Peniophora caesia* (Bres.) Bourd. & Galz., on *Fraxinus* F.  
*P. cinerea* (Fr.) Cke., on *Fagus* T.H.  
*P. incarnata* (Pers.) Cke., H.  
 \**P. leprosa* B. & G., on *Fagus* H.  
*P. quercina* (Pers.) Cke., on *Fagus* H.  
*Psathyra corrugis* (Pers.) Fr., H.  
*Polyporus caesioides* (Schrad.) Fr., F.  
*Polystictus abietinus* (Dicks.) Fr., H.  
*P. versicolor* (Linn.) Fr., H.  
*Solenia anomala* (Pers.) Fr., on *Fagus* T.  
*Stereum hirsutum* (Willd.) Fr., on *Fagus* H.  
*S. purpureum* (Pers.) Fr., H.  
*S. rugosum* (Pers.) Fr., F.  
*S. sanguinolentum* (A. & S.) Fr., on Conifer, H.  
*Trametes mollis* (Sommerf.) Fr., H.  
 \**Tulasnella violacea* (Quél.) B. & G., on *Fagus* H.

## UREDINALES

- Phragmidium violaceum* Wint., III. F.  
*Puccinia baryi* Wint., III. H.  
*P. saniculae* Grev., II, III., H.  
*P. tumida* Grev., III., H.  
*Uromyces poae* Rabenh., OI., H.

## HYPHOMYCETES

- \**Acrothecium delicatulum* Berk. & Br., on *Acer pseudo-platanus*, and *Fraxinus*, T.  
*Arthrobotryum atrum* Berk. & Br., on dead wood, F.  
 \**Botrytis argillacea* group on dead wood, H.  
*B. cinerea* Pers. ex Fr., on inside of bark, H.  
 †*Brachysporium apicale* (Berk. & Br.) Sacc., on *Fraxinus* H.  
 \**B. bloxami* (Cke.) Sacc., on *Betula*, F. on *Quercus* H.  
*B. obovatum* (Berk.) Sacc., on *Fraxinus* H. on *Sambucus* T.  
 \**Chaetopsis bauchii* Grev., on *Fagus* and *Fraxinus* H.  
 \**Clastrosporium fasciculare* (Corda) Sacc., on *Fraxinus* H.  
 \**C. opacum* (Corda) Sacc., on *Fraxinus* H.  
 \**Cryptocoryneum hysterioides* (Corda) Peyronel, on *Sorbus* H., on *Fraxinus* F.H., on *Betula* H. (sub *Exosporium* in Wakefield and Bisby 'List of Hyphomycetes')  
 †*Dendryphium curtum* Berk. and Br., on Umbellifers and *Urtica* T.  
 \**D. griseum* Berk. & Br., on *Urtica* H.  
 \**D. laxum* Berk. and Br., on sacking, F.  
 \**Diplorhinotrichum candidulum* v. Hohnel, on *Sorbus* and *Fraxinus* H.  
 \**Exosporium tilliae* (Link. ex Wallr.) Fr., on *Tillia* F.  
 \**Gliocladium album* (Preuss.) Petch, on *Badhamia* H.  
 †*Gonytrichum caesium* Nees ex Wallr., on *Fraxinus* T.  
*Haplographium bicolor* Grove, on *Fagus* H.  
 \**Helicosporium vegetum* Nees ex Fr., on *Fagus* and *Fraxinus* H.  
 †*Helminthosporium apiculatum* Corda, on *Sorbus* and *Fraxinus*, H.  
 \**H. hyalospermum* Corda, on *Betula* F.  
 \**Helminthosporium simplex* Kunze ex Fr., on *Fraxinus* and *Ulmus* H. (in Wakefield and Bisby sub *H. fusisporium* Berk.).  
 \**H. turbinatum* Berk. & Br., on *Sambucus* H.  
*H. velutinum* Link ex Fr., on *Tillia* F., on *Fraxinus* T.  
 \**Isaria umbrina* Pers. ex Wallr., on *Hypoxylon coccineum* on *Fagus* H.  
*Menisporium ciliata* Corda, on *Quercus* F.  
 \**M. tortuosa* Corda, on *Fagus* H.  
 †*Periconia byssoides* Pers. ex Corda, on *Urtica* T.  
 \**Phaeoisaria cornii* (Bain,) Mason, on *Sambucus* F.T.  
 \**Septocylindrium pallidum* Grove, on *Diatrype stigma* on *Acer*, F.T., on *Diatrype* on *Fraxinus*, T.  
 \**Speira toruloides* Corda, on *Acer pseudo-platanus* H., on *Fagus* H.  
*Sporocybe flexuosa* (Mass.) Mason, on *Sorbus* and *Quercus* H. (M. & G. sub *Graphium*)  
 \**Sporodesmium paradoxum* Corda, on *Betula* F.  
 †*Sporochisma mirabile* Berk. & Br., on *Fagus* H., on *Sorbus* H.  
*Stachylidium cyclosporium* Grove, on rotten wood, F.  
*Stilbum tomentosum* var. *ovalisporium* A. L. Smith (M. & G. sub *Tilachlidium*), on *Trichia* H.  
 \**Torula gyrosa* Cke. & Mass., on Conifer wood, H.  
*T. herbarum* Link ex Fr., on Umbellifers and *Urtica* T.  
*T. ovalispora* Berk., on *Fraxinus* T.H. on *Fagus* H., on *Sambucus* T., on *Cornus* F.  
*Tripodosporium elegans* Corda, on *Fagus* H.  
 \**Verticicladium apicale* (Berk. & Br.) Sacc., on *Fagus* H., on *Sambucus* F.

## COELOMYCETES

- Asterosporium hoffmanni* Kunze, on *Fagus* F. H.  
 †*Phoma acicola* (Lév.) Sacc., on *Pinus* needles H.  
*Phoma complanata* (Tode) Desm., on Umbellifer, H.

*Clavaria contorta* (Holmsk.) Fr. from Forge Valley.—Mr. K. St. G. Cartwright found *Clavaria contorta* on Alder wood at Forge Valley during the Sandsend Fungus Foray. This was identified by Dr. Ramsbottom and should be added to the Sandsend list.—J. GRAINGER.

## YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1947

## SCOTCH CORNER, May 24th-26th

By making Scotch Corner the centre for the Whitsun week-end the Union undertook the investigation of a portion of the county little known to all except the members of the Darlington and Teesdale Naturalists' Field Club, and we were fortunate to have their Secretary, J. B. Nicholson, M.A., to help us with his local knowledge.

The ground had been carefully surveyed by our Divisional Secretary, J. P. Utley, B.Sc., who was assisted by the neighbouring Divisional Secretary, Miss C. M. Rob, F.L.S., and the success of the meeting was due to these energetic workers and to the kindness of the landowners in giving us freedom to visit their estates. The number of members attending was less than has been usual at Whitsun in late years, but the percentage of keen workers was considerably higher. At the general meeting fourteen societies responded to the roll call.

At Forcett the ancient earthworks were noted on entering the Park. A mound 18 ft. high above the ditch level drew attention to this feature. This earthwork, some  $4\frac{1}{2}$  miles in all, encloses 675 acres with a possible annex of 150 acres to the south of Stanwick Hall. Forcett Park and fish pond provided interesting ground for the ornithologists, and the botanists found the old railway and the disused quarries good hunting areas.

Smelt Mill Gill at Hartford proved more interesting to the general naturalists, and certainly more difficult to traverse. It should be revisited with more time available and at varying seasons.

The excursion to Skeeby Beck took us into open country where springs provided marshy places. In one of these the plentiful watercress was attacked by a brilliant blue-black beetle identified by W. D. Hincks as *Phaedon amoraciae* L.

**Flowering Plants** (C. M. Rob): The ground covered on Saturday was not good for flowering plants. The park at Stanwick had suffered from ploughing out and felling, and produced very little of interest; a small amount of *Menyanthes trifoliata* L. in the lake was the only noteworthy plant. Forcett Park was better, but a large part of this had also been ploughed. The Yews were particularly fine, but in common with most evergreens showed signs of damage from the severe winter. Near the lake were some trees of the cut-leaved variety of *Fagus sylvatica* L., and in the higher part of the park a number of fine Beeches. *Myosotis sylvatica* (Ehrh.) Hoffm., *Anchusa sempervirens* L., and *Geum rivale* L. were in the wooded part of the park, *Poa nemoralis* L. on stonework near the lake, and *Salix fragilis* L. in the wetter ground nearby. *Ophioglossum vulgatum* L. was seen on the embankment of the mineral railway, and *Geranium pyrenaicum* Burm. f. near Caldwell village.

*Draba muralis* L. on a wall near the starting point was an excellent beginning for Sunday's excursion. It was first noted here in 1932 and is still in fair quantity; the nearest known station and only other one in V.C. 65 is in the Greta Valley. The other plants seen this day included *Euonymus europaeus* L. (badly barked by rabbits), *Geum intermedium* Ehrh., *Adoxa Moschatellina* L., *Orchis mascula* L., *Coeloglossum viride* (L.) Hartm., *Paris quadrifolia* L., and *Cystopteris fragilis* (L.) Bernh. The Bluebells in Smelt Mill Gill were a fine sight, as were the ferns both in the Gill and higher up. *Geranium lucidum* L. and *Saxifraga tridactylites* L. were on walls in Washton village and in a wet 'carr' near Hartforth were a number of trees of *Salix pentandra* L.

Monday provided a very different type of ground. By the Swale near Brompton *Petasites hybridus* (L.) Gaertn., Mey. and Schreb. was fruiting well. *Cardamine amara* L., *Stellaria nemorum* (L.) Vill., *Ribes rubrum* L., *Myrrhis odorata* (L.) Scop., and *Salix purpurea* L. were also seen in this neighbourhood. *Potamogeton crispus* L. in Skeeby Beck, *P. densus* L. in the beck and in pools of flood water near, *Saxifraga granulata* L., *Valeriana dioica* L., and *Carex riparia* Curtis were seen by the beck side. *Daphne Laureola* L. in hedges between Skeeby and Scotch Corner, *Taraxacum erythrospermum* Andrz. on a dry bank near Skeeby bridge, *Ranunculus Drouetii* F. Schultz, and *Nitella opaca* Ag. in a muddy pond also near Skeeby, were some of the best plants seen on this excursion.

**Bryophyta** (A. Thompson) : MOSSES.—Over 80 species were found, all common ones. *Eurhynchium praelongum* Hobk., var. *Stokesii* Brid. had not been noted in the district before, although it is abundant in the woods visited, and is a new record for the variety for V.C. 65.

*Sphagnum fimbriatum* Wils. from Smelt Mill Gill was the only *Sphagnum* gathered.

The following occurred in several parts of the district :

- |  |  |
|--|--|
| <i>Tetraphis pellucida</i> Hedw.           | <i>Mnium punctatum</i> L.                |
| <i>Catharina undulata</i> W. and M.        | <i>Fontinalis antipyretica</i> L.        |
| <i>Ceratodon purpureus</i> Brid.           | <i>Neckera crispa</i> Hedw.              |
| <i>Dichodontium pellucidum</i> Schp.       | <i>N. complanata</i> Huebn.              |
| <i>Dicranella heteromalla</i> Schp.        | <i>Porotrichum alopecurum</i> Mitt.      |
| <i>Dicranoweisia cirrata</i> Lindb.        | <i>Thuidium tamariscinum</i> B. and S.   |
| <i>Dicranum scoparium</i> Hedw.            | <i>Climacium dendroides</i> W. and M.    |
| <i>Fissidens bryoides</i> Hedw.            | <i>Camptothecium sericeum</i> Kindb.     |
| <i>F. taxifolius</i> Hedw.                 | <i>Brachythecium rutabulum</i> B. and S. |
| <i>Grimmia apocarpa</i> Hedw.              | <i>B. rivulare</i> B. and S.             |
| <i>G. pulvinata</i> Smith.                 | <i>B. velutinum</i> B. and S.            |
| <i>Tortula muralis</i> Hedw.               | <i>B. populeum</i> B. and S.             |
| <i>T. subulata</i> Hedw.                   | <i>Eurhynchium praelongum</i> Hobk.      |
| <i>T. ruralis</i> Ehrh.                    | <i>E. Swartzii</i> Hobk.                 |
| <i>Barbula cylindrica</i> Schp.            | <i>E. rusciforme</i> Milde.              |
| <i>B. convoluta</i> Hedw.                  | <i>Plagiothecium elegans</i> Sull.       |
| <i>B. unguiculata</i> Hedw.                | <i>P. denticulatum</i> B. and S.         |
| <i>Encalypta streptocarpa</i> Hedw.        | <i>Amblystegium serpens</i> B. and S.    |
| <i>Orthotrichum anomalum</i> Hedw., var.   | <i>A. Juratzkanum</i> Schp.              |
| <i>saxatile</i> Milde.                     | <i>A. filicinum</i> De Not.              |
| <i>Funaria hygrometrica</i> Sibth.         | <i>Hypnum riparium</i> L.                |
| <i>Aulacomnium androgynum</i> Schwaeg.     | <i>H. cupressiforme</i> L.               |
| <i>Orthodontium gracile</i> Schwaeg., var. | <i>H. molluscum</i> Hedw.                |
| <i>heterocarpa</i> Wats.                   | <i>H. palustre</i> Huds.                 |
| <i>Bryum caespiticium</i> L.               | <i>H. cuspidatum</i> L.                  |
| <i>B. capillare</i> L.                     | <i>Hylocomium squarrosum</i> B. and S.   |
| <i>Mnium undulatum</i> L.                  | <i>H. triquetrum</i> B. and S.           |
| <i>M. hornum</i> L.                        |  |

In Smelt Mill Gill there were :

- |                                      |   |
|--------------------------------------|---|
| <i>Polytrichum aloides</i> Hedw.     | <i>Homalia trichomanoides</i> B. and S.     |
| <i>P. gracile</i> Dicks.             | <i>Heterocladium heteropterum</i> B. and S. |
| <i>P. formosum</i> Hedw.             | <i>Eurhynchium myurum</i> Dixon,            |
| <i>Dicranum majus</i> Turn.          | <i>E. striatum</i> B. and S.                |
| <i>Physcomitrium pyriforme</i> Brid. | <i>Plagiothecium undulatum</i> B. and S.    |
| <i>Bryum pallens</i> Sw.             | <i>Hylocomium splendens</i> B. and S.       |

Near Skeeby Beck we found :

- |                                   |                               |
|-----------------------------------|-------------------------------|
| <i>Dicranella Schreberi</i> Schp. | <i>Bryum argenteum</i> L.     |
| <i>Tortula mutica</i> Lindb.      |                               |
| <i>Webera carnea</i> Schp.        | <i>Leskea polycarpa</i> Ehrh. |

In Forcett Park :

- |                                       |   |
|---------------------------------------|---|
| <i>Campylopus fragilis</i> B. and S.  | <i>Orthotrichum diaphanum</i> Schrad.             |
| <i>Zygodon viridissimus</i> R. Brown. | <i>Mnium affine</i> Bland., var. <i>elatum</i> B. |
| <i>Orthotrichum affine</i> Schrad.    | and S.  |

In Forcett Quarries : *Camptothecium lutescens* B. and S.

Fallow field near Whashton Springs : *Pleuridium alternifolium* Rabenh.

Sedbury Park : *Barbula rubella* Lindb., and *Eurhynchium murale* Milde.

Middleton Tyas : *Bryum pendulum* Schp.

Scotch Corner : *B. atropurpureum* W. and M.

Railway bank : *Mnium stellare* Reich.

Skeeby Plantation : *Hypnum aduncum* Hedw.



HEPATICS.—*Metzgeria furcata* (L.) Dum., and *Frullania dilatata* (L.) Dum. occurred in several places, *Lophocolea heterophylla* (Schrad.) Dum., in Forcett Park, and the following were found in Smelt Mill Gill:

<i>Conocephalum conicum</i> (L.) Dum.	<i>Lophocolea bidentata</i> (L.) Dum.
<i>Lunularia cruciata</i> (L.) Dum.	<i>Cephalozia media</i> Lindb.
<i>Marchantia polymorpha</i> L.	<i>Calypogeia fissa</i> (L.) Raddi.
<i>Pellia epiphylla</i> (L.) Corda.	<i>Lepidozia reptans</i> (L.) Dum.
<i>Plagiochila asplenoides</i> (L.) Dum.	<i>Diplophyllum albicans</i> (L.) Dum.

**Fungi** (W. G. Bramley): The writer is indebted to Miss Sykes and Messrs. Payne and Nicholson for many of the records included. Aecidia of *Puccinia chaerophylli* were very plentiful on the river bank at Brompton-on-Swale.

\* Not in Mason and Grainger for V.C. 65.

### MYXOMYCETES

<i>Lycogala epidendrum</i> Fr.	<i>Trichia botrytis</i> Pers.
<i>Reticularia Lycoperdon</i> Bull.	<i>T. persimilis</i> Karst.

### PHYCOMYCETES

\**Peronospora ficariae* Tul.

### ASCOMYCETES

<i>Mollisia cinerea</i> (Batsch) Fr.	* <i>Leptosphaeria derasa</i> (B. and Br.)
<i>Polydesmia pruinosa</i> (B. and Br.) Boud.	Auersw., on <i>Senecio</i> stems.
* <i>Colpoma quercinum</i> (Pers.) Wallr.	<i>Diaporthe arctii</i> .
<i>Dialonectria sanguinea</i> (Bolt.) Cke.	* <i>Cryptospora suffusa</i> (Fr.) Tul.
* <i>Hypocrea pulvinata</i> Fckl.	* <i>Melanconis alni</i> Tul.
<i>Chaetosphaeria phaeostroma</i> (Mont.)	<i>Diatrypella quercina</i> (Pers.) Nits.
Fckl.	<i>Ustilina vulgaris</i> Tul.
<i>Melanomma pulvis-pyrius</i> (Pers.) Fckl.	<i>Hypoxyton fuscum</i> (Pers.) Fr.
<i>Leptosphaeria acuta</i> (M. and M.) Karst.	<i>H. multifforme</i> Fr.

### BASIDIOMYCETES

<i>Urocystis anemones</i> (Pers.) Wint., on <i>Anemone</i> .	<i>P. lapsanae</i> Fckl., on <i>L. communis</i> , I, II.
* <i>Melanpsora lini</i> (Ehrenb.) Lév., on <i>L. catharticum</i> , II.	<i>P. obtegens</i> Tul., on <i>C. arvense</i> , II.
<i>M. rostrupii</i> Wagner., on <i>Mercurialis</i> , I.	<i>P. poarum</i> Niels., on <i>Tussilago</i> , I.
<i>Phragmidium fragariastrum</i> Schroet., on <i>P. sterilis</i> , I.	<i>P. primulae</i> (DC.) Duby, on <i>P. vulgaris</i> , I.
<i>Uromyces alchemillae</i> Lév., on <i>A. vulgaris</i> , II.	<i>P. oblongata</i> Wint., on <i>Luzula sylvatica</i> , II.
<i>U. ficariae</i> Lév., on <i>R. ficaria</i> , III.	<i>P. tumida</i> Grev., on <i>C. denudatum</i> , III.
<i>U. geranii</i> Oth. and Wart., on <i>G. pratense</i> , I.	<i>P. violae</i> (Schum.) DC., on <i>V. Riviniana</i> and <i>V. hirta</i> , I.
<i>U. poae</i> Rabenh., on <i>R. ficaria</i> , I.	<i>Tricholoma gambosum</i> Fr.
<i>U. scillarum</i> (Grev.) Wint., on <i>Scilla nutans</i> , III.	<i>Hypholoma fasciculare</i> (Huds.) Fr.
<i>Puccinia betonicae</i> DC., III.	<i>Coprinus plicatilis</i> (Curt.) Fr.
<i>P. chaerophylli</i> Purt., on <i>Myrrhis</i> , I.	<i>Polyporus squamosus</i> (Huds.) Fr.
<i>P. chondrillae</i> Corda, on <i>Lactuca muralis</i> , I.	<i>P. betulinus</i> (Bull.) Fr.
* <i>P. epilobii</i> DC., on <i>E. montanum</i> and <i>E. obscurum</i> , III.	<i>Fomes ferruginosa</i> (Schrad.) Mass.
<i>P. fusca</i> Wint., on <i>Anemone</i> , III.	<i>Ganoderma applanatum</i> (Pers.) Pat.
<i>P. hieracii</i> Mart., on <i>H. Pilosella</i> , II.	<i>Polystictus versicolor</i> (Linn.) Fr.
<i>P. lolii</i> Niels., on <i>Rhamnus cathartica</i> , I.	<i>Trametes mollis</i> (Sommerf.) Fr.
	<i>Stereum hirsutum</i> (Willd.) Fr.
	<i>Corticeum</i> (Gloeo.) <i>praetermissum</i> (Karst.) Bres.
	<i>Solenia anomala</i> (Pers.) Fr.
	<i>Auricularia auricula-judae</i> (Linn.) Schroet.
	<i>Lycoperdon giganteum</i> (Batsch) Pers.

**Ornithology** (R. Chislett): In a district that few members thought to be suitable for our week-end meeting, but was quite fitting because the Y.N.U. had never worked it previously, it was possible to report the presence in the areas visited of 67 species of birds, a fact that speaks volumes for the careful planning of itineraries by J. P. Utley and Miss Rob, who had spared no efforts to make the meeting the success it proved to be.

Forcett Park, the main scene of operations on the Saturday, is normal country park scenery with a lake and some old woods. Here a considerable Rookery, Nuthatches, a Great Spotted Woodpecker that left its nesting hole hurriedly, Tree-creepers, five species of Tit, including two pairs of Marsh Tits visiting holes to feed young, many Garden Warblers, a Blackcap, and Mallard and Moorhen were observed.

On the Sunday, Smelt Mill Gill proved to be a very attractive place, and was well-wooded as it climbed back deviously towards the moors. A Redstart's nest held four eggs. Dippers had young away from their empty nest. Three cock Pied Flycatchers sang their silvery notes. A Great Spotted Woodpecker drummed under concerted observation, vibrating its head as it delivered the blows on the dead bough as though it had a rubber neck, and with its mate visited and flew around a tall, holed, dead stump, uttering cries only heard from the species under emotional stress. Common Sandpiper, Wood Warbler, Yellow and Pied Wagtails were noted, and Nuthatches allowed close observation.

The interesting walk planned for the Monday led through some rough bushy land (three Bullfinches, Whitethroats, Garden Warblers, Willow Warblers, etc.); then along field sides and an occupation road, where Skylarks abounded, down to the Swale, where Sand-Martins and rather surprisingly Common Gulls were added to the list. The walk back by the Skeeby Beck added the Kingfisher and the Corncrake.

Birds seen on all three days were Carrion Crow, Rook, Jackdaw, Starling, Greenfinch, Chaffinch, House Sparrow, Yellowhammer, Skylark, Tree-pipit, Great Tit, Blue Tit, Spotted Flycatcher, Willow Warbler, Garden Warbler, Whitethroat, Song-Thrush, Blackbird, Robin, Hedge-Sparrow, Swallow, House-Martin, Swift, Cuckoo, Kestrel, Wood-Pigeon, Lapwing, Curlew, Black-headed Gull, Pheasant, Common Partridge. The following were noted on two days only: Magpie, Linnet, Yellow Wagtail, Nuthatch, Marsh-Tit, Long-tailed Tit, Blackcap, Wheatear, Wren, Great Spotted Woodpecker, Tawny Owl, Stock Dove, Sandpiper, Moorhen. Birds only seen on one day were Jay, Bullfinch, Meadow-pipit, Grey Wagtail, Tree-Creeper, Goldcrest, Pied Flycatcher, Wood Warbler, Sedge Warbler, Mistle-Thrush, Whinchat, Dipper, Sand-Martin, Kingfisher, Mallard, Turtle Dove, Common Gull, Corncrake.

That Mistle-Thrush and Goldcrest were only noted once was doubtless a consequence of the severe winter. All the Wagtails and Owls and the Wren were scarce.

**Diptera** (C. A. Cheetham): Entomology was only worked by a Lepidopterist and Dipterist. In the latter group the Secretary reports nine species as additions to V.C. 65. In a shallow drinking place at the north-west end of the Forcett fish pond, the Mosquito *Anopheles claviger* Mg. (*bifurcatus* L.) was attentive and in this pool a single *Phalacropera replicata* L. was caught. The moss-eating larva of the latter usually feeds on *Hypnum* so that it was surprising to find it in a station where apparently the only moss was *Fontinalis*.

In Smelt Mill Gill diptera were plentiful and some interesting Syrphids caught there were *Criorrhina floccosa* Mg., *C. berberina* F., *Helophilus hybridus* Lw., *H. pendulus* L., *Leucozona lucorum* L., *Orthoneura brevicornis* Lw., *Chilosia variabilis* Pz., *C. albitarsis* Mg., *C. sparsa* Lw., *C. maculata* Fln., *Baccha elongata* F., *Sphegina clunipes* Fln. In this Gill the common Daddy Longlegs was *Tipula hortulana* Mg. and in dark corners by the stream *Dolichochepea sylvicola* Curt. was occasionally seen. Other *Tipula* species caught on the excursions were *vittata* Mg., *rufina* Mg., *lateralis* Mg., *montium* Egg., *luna* Westff., *oleracea* L. Only a single yellow and black species, *Pachyrhina maculata* Mg. was noted, but the small black *Ptychoptera* were represented by *paludosa* Mg., *scutellaris* Mg. and *contaminata* L. The large black *Bibio marci* L. was often seen hovering in the air and *B. reticulatus* Lw. and *B. nigriventris* Hal. were taken. On the marshy places by Skeeby Beck several specimens of *Porphyrops crassipes* Mg. occurred.

Other species included in the captures are *Chironomus plumosus* L., *Limnobia macrostigma* Schum., *L. nubeculosa* Mg., *Ormosia nodulosa* Mcq., *Tricyphona immaculata* Mg., *Limnophila meigenii* Verr., *Syrphus ribesii* L., *S. corollae* F., *Ditaenia schoenherri* Fln., *Chirosia albitarsis* Ztt. and *Tetanocera elata* F.

**Lepidoptera** (J. Sykes): The numbers of individuals and of species seen were smaller than the fair weather conditions would have led one to expect.

**BUTTERFLIES.**

Large White.	<i>Pieris brassicae</i> L.	} in small numbers.
Small White.	<i>P. rapae</i> L.	
Green-veined White.	<i>P. napi</i> L.	
Orange Tip.	<i>Anthocharis cardamines</i> L.	} single specimens only.
Meadow Brown.	<i>Maniola jurtina</i> L.	
Small Tortoiseshell.	<i>Aglais urticae</i> L.	

**MOTHS.**

Brown Silver Line.	<i>Phasiane petrararia</i> Hübner.	Common in Smelt Mill Gill.
Common White Wave.	<i>Cabera pusaria</i> L.	Forcett Park.

Caterpillars of the Magpie moth feeding on Gooseberry were very common near Caldwell, and larvae of Drinker and Tiger moths were also noted.

**Plant Galls** (J. B. Nicholson):

<i>Andricus radialis</i> F., on Oak.	Forcett Park.
<i>A. curvator</i> Htg., on Oak.	Forcett Park.
<i>A. quadrilineatus</i> Htg., on Oak.	Smelt Mill Gill.
<i>Trigonaspis megaptera</i> Pz., on Oak.	Smelt Mill Gill.
<i>Neuroterus baccarum</i> L., on Oak.	Smelt Mill Gill.
<i>Eriophyes fraxini</i> Karp., on Ash.	Stanwick.
<i>E. similis</i> Nal., on Blackthorn.	Skeebay Plantation.

**ANSTON STONES WOOD AND LINDRICK COMMON, June 7th**

Though the early morning was wet the weather was kind for the rest of the day. A large party assembled at South Anston; the Sorby and Rotherham Societies and Professor Chesters' party from Nottingham tended to keep to their own groups whilst Y.N.U. members mixed in where interest pointed the way, but our very capable guide, Mr. John Brown, could not hope to keep this large party together.

In Anston Stones Wood the dense vegetation was too wet in the morning and entomologists could do little sweeping, but the startling number of Clouded Magpie Moths will long be remembered. Some small bushes seemed to hold more moths than leaves. A black plant-hopper with deep red spots, *Triecphora vulnerata*, kept attracting attention from various members.

On the Common the wind dried the vegetation but kept the insects down. Botanists who came expecting to see an odd specimen of the uncommon Stemless Thistle were surprised to have to pick their steps to avoid treading on its spiny leaves. From here to Shireoaks for tea the path was difficult to find and some parties lacking local knowledge missed one of the choicest areas, an extensive disused quarry with much marshy ground. Fortunately Mr. W. G. Bramley was taken to this place and he picked up a very showy fly and brought it to the tearoom and after the meeting he took a party back to this interesting spot.

A short meeting was held after tea. Mr. W. G. Bramley took the chair in the absence of our President and Vice-Presidents and nine societies responded to the roll call.

**Flowering Plants** (W. A. Sledge): At Anston Stones Wood the species of particular interest which were seen included *Aquilegia vulgaris* L., *Astragalus glycyphyllos* L., *Vicia sylvatica* L., *Cirsium heterophyllum* (L.) Hill, *Serratula tinctoria* L., *Carex digitata* L., *Melica nutans* L., and *Hordeum europaeum* (L.) All. As mentioned in the circular both *Tilia platyphyllos* Scop., and *T. cordata* Mill., grow in the wood and although there is clear evidence of planting with some trees the occurrence of the Limes amongst the rocky outcrops of magnesian limestone where planting would be least likely favours the view that these species may well be indigenous here. Their claims are certainly as strong as on the corresponding geological formation in Derbyshire where they have been regarded as

native. Yews are also present on the cliffs and elsewhere a mixture of Sycamore, Ash and Elm. Other species noted in and about the wood include *Hypericum montanum* L., *Euonymus europæus* L., *Crataegus oxyacanthoides* Thuill. (a single tree in a hedge), *Galium Mollugo* L., *Erigeron acris* L., *Inula Conyza* DC., *Galeobdolon luteum* Huds., *Ophrys muscifera* Huds., *Tamus communis* L., *Helictotrichon (Avena) pubescens* (Huds.) Pilger, and *Bromus erectus* Huds.

The rough, Gorse-dotted grasslands of Lindrick Common contain many calcicolous species. *Bromus erectus* Huds., *Brachypodium pinnatum* (L.) Beauv., and *Festuca ovina* L., are the commonest grasses with *Helictotrichon (Avena) pratense* (L.) Pilger, *Koeleria gracilis* Pers., and *Briza media* L. Other species typical of the Common are *Helianthemum Chamaecistus* Mill., *Viola hirta* L., *Polygala vulgaris* L., *Linum catharticum* L., *Lotus corniculatus* L., *Anthyllis vulneraria* L., *Poterium sanguisorba* L., *Galium verum* L., *Carlina vulgaris* L. and *Cirsium acaule* (L.) Scop. The last named species which reaches its northern limit in Yorkshire, grows here in the greatest profusion. Other less widely distributed species include *Antennaria dioica* (L.) Gaertn., *Ophrys muscifera* Huds. and *Carex ericetorum* Poll.

The extensive quarries at Shireoaks proved very interesting ground with a varied flora owing to the development of marshes and pools in the bottoms close to the dry grass and bush-covered mounds. Here *Astragalus glycyphyllos* L., *Samolus Valerandi* L., *Daphne Laureola* L., *Ophrys muscifera* Huds., *Blysmus compressus* (L.) Link, *Carex lepidocarpa* Tausch. and *C. distans* L. were amongst the most interesting species observed.

**Fungi** (W. G. Bramley) : The following were noted or brought to the notice of the recorder.

*Tricholoma gambosum* Fr. St. George's Mushroom.  
*Gyroporus cyanescens* (Bull.) Quel.  
*Ustilago tragopogonis-pratensis* (Pers.) Wint.  
*U. violacea* (Pers.) Tul., on *Lychnis dioica*.  
*Puccinia betonicae* DC., on *S. betonica*, III.  
*P. hieracii* Mart., on *H. boreale*, II. and *H. Pilosella*, II., III.  
*P. obtegens* Tul., on *C. arvense*, O., II.  
*P. poarum* Niels., on *Tussilago*, O., I.

*Anthostoma gastrinum* (Fr.) Sacc., on Elm.  
*Diatrypella favacea* (Fr.) Ces. and de Not., on Beech.

**Diptera** (C. A. Cheetham) : Though the wet night and early morning made sweeping useless in Anston Stones Wood some of the larger Craneflies were caught, amongst them the *Tipula* whose larvae live in rotten logs, *T. flavolineata* Mg., and the striking *Pachyrhina crocata* L., whose golden bands stand out from the dull black body. The marked wings of *Epiphragma ocellaris* L. (*picta* F.) were seen on several specimens of a small swarm, others were usual woodland species like *Limnobia nubeculosa* Mg., *L. tripunctata* F., *L. flavipes* F., *Limnophila ochracea* Mg., *Tipula unca* Weid. (*longicornis* Schum.), *T. olivacea* L. and *T. lateralis* Mg.

In a small wood near the golf course some tall umbels were dry and had a good many insects on them :—*Chilosia illustrata* Harr., *Leucozona lucorum* L., *Chloromyia formosa* Scop., *Eristalis intricarius* L., *E. horticola* Deg., *Empis tessellata* F. and *Graphomyia maculata* Scop.

The best collecting was done in the evening in the old quarry where Mr. W. G. Bramley had picked up *Stratiomys potamida* Mg. in the afternoon. This was found again with other members of the Stratiomyid family :—*Oxycera trilineata* F., *O. pygmaea* Fal. and *Nemotelus nigrinus* Fal. This family of flies is a southern group and we were in the most southerly corner of Yorkshire. This extensive, wet quarry would well repay constant visits. Amongst other species were *Limnophila lucorum* Mg. (very plentiful), *Rhamphidia longirostris* Mg., *Ptychoptera contaminata* L., *Dioctria rufipes* Deg., *Pyrophæna granditarsa* Forst., *Eristalis sepulchralis* L., *Tetanocera robusta* Lw., *T. laevifrons* Lw., *Limnia unguicornis* Scop., *Liogaster metallina* F., *Dolichopus unguulatus* Mg., *D. pennatus* Mg., *Chrysotus cilipes* Mg., *Syntormon pumilis* Mg. and *Parhydra quadripunctata* Mg.

Eight of these species have not been recorded previously from V.C. 63.



**Lepidoptera** (Joyce Sykes) : Species seen :—**BUTTERFLIES** (11 species).

The Wall.	<i>Pararge aegeria</i> L.	
Small Heath.	<i>Coenonympha pamphilus</i> L.	Common.
Painted Lady.	<i>Vanessa cardui</i> L.	Shireoaks.
Common Blue.	<i>Polyommatus icarus</i> Rott.	
Small Copper.	<i>Lycaena phlaeas</i> L.	
Large White.	<i>Pieris brassicae</i> L.	
Small White.	<i>Pieris rapae</i> L.	
Green-veined White.	<i>Pieris napi</i> L.	
Orange Tip.	<i>Anthocharis cardamines</i> L.	
Grizzled Skipper.	<i>Pyrgus malvae</i> L.	
The Large Skipper.	<i>Ochlodes venata</i> Bremer and Grey.	Common.

**MOTHS** (7 species).

Clouded Magpie.	<i>Abraxas sylvata</i> Scopoli.	Exceedingly abundant in woods.
Silver Ground Carpet.	<i>Larentia montanata</i> L.	Very common.
Common Carpet.	<i>Larentia sociata</i> Borkhausen.	
Cinnabar.	<i>Hippocrita jacobaeae</i> L.	
Grey Dagger.	<i>Acronycta psi</i> L.	
Chimney Sweeper.	<i>Odesia atrata</i> L.	Common by Anston Stones Wood.
Brimstone.	<i>Opisthograptis luteolata</i> L.	

Caterpillars of the Drinker, the Magpie, the Goldtail and Burnet moths were seen. Judging by the number of species seen in the prevailing windy conditions this area should prove first rate in better weather.

**SOUTH CAVE, June 21st.**

The success of this meeting was due to the untiring efforts of our Divisional Secretary, Mr. C. W. Mason, who was helped in his work by Mr. C. F. Procter and other members of the Hull Societies. No accommodation being available in the village they transported crockery, etc., to the station where the staff kindly provided boiling water. Tea was made available for lunch and for teatime and the waiting room served for the meeting at which our President took the Chair.

Immediately after leaving the station we entered a disused quarry and newcomers amongst the members were astonished at the heaps of fossils and the immense number of nests of the Sand Martins. The botanists and ornithologists worked to the east by Springhead and East Dale whilst the geologists who had assembled in goodly number to greet our President, worked to the west of the station.

**Geology** (P. C. Sylvester-Bradley) : After Mr. Mason had distributed a most helpful map showing the location of the quarries to be visited, the party proceeded by car to the marl pit at Hotham Hill (national grid reference 44/885342). This pit was first described by Blake (1872), and is his Pit No. 5. At that time it was no longer being worked, and it has been grassed over for some seventy years. In 1945 it was re-opened. It has now once more been abandoned, and is fast deteriorating. Only the upper beds were visible ; they were measured, and the section appeared as follows :—

LOWER LIAS (Hettangian)—										ft.	in.
Blue, bituminous shales and shaly marl, with three conspicuous bands of white cementstone. <i>Psiloceras planorbis</i> frequent in the lower 6 ft.											
seen to ...	...	...	...	...	...	...	...	...	...	24	0
Marlstone ...	...	...	...	...	...	...	...	...	...	1	0
Shaly Marl ...	...	...	...	...	...	...	...	...	...	3	0
Oyster Bed. Limestone, a mass of <i>Ostrea irregularis</i> seen to	...	...	...	...	...	...	...	...	...	1	6

The beds below were obscured, but in 1946 showed a further 11 ft. of marls, clays and limestones with *Ostrea*. Broken slabs of the oyster bed now lie scattered about the floor of the pit, and afforded a splendid opportunity of gathering their

characteristic fossil. Members obtained several examples of *Psiloceras planorbis* from the lower part of the shales. There was little time to search the higher beds for *Caloceras johnstoni*, which may be expected to occur, and which I have found in the upper part of the old pit on the south side of the crossroads (Blake's Pit, No. 6). It would seem that Blake (who was unsuccessful in finding ammonites in any of pits 4, 5 or 6) was dealing with beds lower than those now exposed, for the oyster bed was near the top of his sections. Mr. Shillito exhibited a fine set of specimens obtained from clay-washings from this pit, including echinoid plates and radioles, ophiuroid vertebral ossicles, crinoid columnals, and hundreds of ostracods, mostly of the species *Cytherella ellipsoidea* (Jones).

The party then returned to the vicinity of South Cave station, where a small new pit in the Cave Oolite was visited. This lies to the north of the railway, on the east side of the road (grid 44/918331) and shows the oolite decalcified at the top, and containing pockets of sand let in from above. No fossils were found.

In the same field, a little further to the east (grid 44/919332) another new pit showed some 10 ft. of unfossiliferous white sands; in removing the overburden, the quarrymen had laid bare about 1 ft. of ferruginous and fossiliferous Kellaways Rock, containing abundant *Gryphaea bilobata*. A discussion then ensued as to whether the sands of the pit correspond to the fossiliferous sands below the ferruginous Kellaways of the Drewton Cutting quarry (which could be seen across the valley some 300 yards to the south), which there contain large doggers, abundant belemnites, and occasionally other marine fossils; or whether the fossiliferous sands were missing, and these sands should be correlated with the unfossiliferous so-called Upper Estuarine sands below.

The classical exposure adjoining Drewton cutting (grid 44/920328) was now visited. Recent work in removing the sands has exposed a thickness of some 10 ft. of white unfossiliferous and slightly argillaceous sand underlying the true marine Kellaways Sands above. Some doubtful plant remains were found, which would indicate a freshwater environment, but Professor Fearnside pointed out the occurrence of glauconite in the upper part, a mineral usually associated with marine sediments. Some time was spent in breaking up the large blocks of ferruginous stone in the main quarry, and hunting for fossils. Fragments of *Kosmoceras* were abundant, and one piece of a large *Proplanulites* was found. The usual nests of *Rhynchonelloidea socialis* turned up, and internal casts of a *Magellania* (s.l.). A fine *Pinna* and a *Goniomya* were noted among the lamellibranchs. From a recently made dump of the Oxford Clay above impressions of *Kosmoceras* spp. were found.

The marine sands with doggers are again exposed in two new pits adjoining each other on the west side of the road (grid 44/917326). The chalk and flint gravel was seen cutting clearly across the sands, in which were found the ubiquitous *Gryphaea bilobata* and belemnites.

The party, somewhat attenuated by this time, then strode through the luxuriant nettles of the hedgerows to the interesting new quarry in the Cave Oolite in "East Field" (grid 44/915322). This large quarry has been excavated during the war on the site of the much smaller "old quarry" marked on the large scale maps. The following section was displayed:—

Drift :	ft. in.
Disturbed, sandy sub-soil, cutting across the beds below, and filling sink-holes in the oolite	

*Upper Estuarine Beds* :—

Variegated sands and clays. Lignite. Seen to	...	...	...	...	4	0
--	-----	-----	-----	-----	---	---

*Cave Oolite* :—

Flaggy, false-bedded oolite. <i>Entalophora straminea</i> , <i>Gervillea</i> sp.	...	17	10
Massive, blue-hearted, oolitic calcite-mudstone. <i>Trigonia</i> sp., terebratulids, etc.	...	...	...
		1	3

*Variable Beds* (= "Basement Beds") :—

(Thrown out of sump. Sequence speculative)	...	...	...	c.	6	0
Rubbly oolite and marl. <i>Pholadomya</i> sp., <i>Trigonia</i> sp., <i>Entalophora straminea</i> .						

Blue shales.

Rubbly argillaceous ironstone. *Astarte* sp., *Pecten personatus* and many other lamellibranchs; *Serpula* sp.

The section is of particular interest in that it is far more fossiliferous than is usual in the Cave Oolite. The terebratulids from the basal bed of the Cave Oolite, and the numerous fossils from the Variable Beds thrown out of the sump would repay careful collecting. The sump provides one of the very few sections through the upper part of the Variable Beds that is known north of the Humber. Professor Louis Guillaume of Paris (whom we were glad to welcome as a guest on this excursion) identified *Pecten personatus* from the ironstone.

The party now moved over to the old quarries adjoining the railway, immediately to the west of South Cave station (grid 44/915325) and described by Stather (1922). The flaggy oolite is still to be seen in large, shallow quarries on the top of the hill, and a channel filled with drift (sand) cuts through the oolite, and has itself been dug in a couple of pits. The section adjoining the line shows some 15 ft. of white sands, with a sandy oolite below, and cut across by some puzzling beds of drift above (see fig. 1, which is from a sketch by Professor Guillaume). The drift has at its base a band of chalk and flint gravel, with variable clays and sands above. Overlying this is a block of Cave Oolite so large that it appears at first sight to be in position. The sandy oolite below the sand is well exposed in a small quarry face situated at right angles to the main section, at its eastern extremity (grid 91/553263); where alternating bands of sandstone

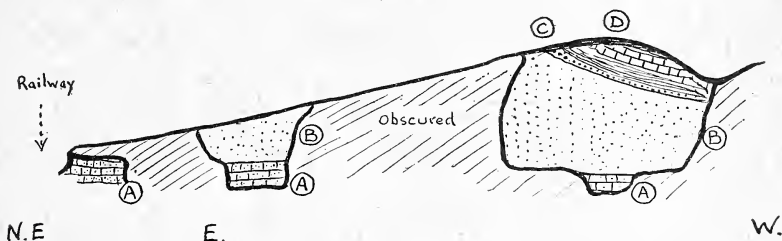


Fig. 1. Exposure 250 yards West of South Cave Station.

From a sketch by M. Guillaume. A. Sandy Oolite; B. Uufossiliferous White Sands; C. Chalk and Flint Gravel; D. Cave Oolite.

and sandy limestone can be seen. These beds are quite different from the true Cave Oolite, and do not seem to be merely the Oolite in decalcified condition. The white sands above much resemble the unfossiliferous (? Upper Estuarine) sands which occur below the Kellaway Beds in the Drewton Cutting Quarry, but in position would seem to lie below the Cave Oolite, and so presumably represent the Lower Estuarine Beds. The sandy oolite would then indicate a marine episode—a foretaste of the seas which later gave rise to the Cave Oolite. These strata would together form part of the Variable Beds below those exposed in the East Field Quarry sump. No fossil evidence was found to support this theory, however, and no sign of the fossiliferous ironstone of the East Field Quarry could be found among the débris of oolite in the section of drift.

With these stimulating ideas to consider, the party rallied to refreshments and rejoined their comrades.

#### References:

- BLAKE, J. F., 1872. On the Infralias of Yorkshire. *Quart. Journ. Geol. Soc.*, vol. 28, pp. 132-147.  
 STATHER, J. W., 1922. A New Section in the Oolites and Glacial Deposits near South Cave. *Trans. Hull Geol. Soc.*, vol. 6, pp. 244-248.

**Flowering Plants** (Eva Crackles): Proceeding along the railway line from South Cave station *Linaria minor* (L.) Desf. was much in evidence. In the quarry just east of the station the most notable species were *Trifolium arvense* L., *Vicia hirsuta* (L.) S. F. Gray and *Reseda Luteola* L., while nearby good patches of *Erigeron acris* L. and *Aquilegia vulgaris* L. were in flower. On the edge of a copse in Drewton Dale *Campanula latifolia* L. was seen.

Caliculous associations on the banks near Weedley consisted of such typical species as *Thymus serpyllum* L., *Helianthemum Chamaecistus* Mill., *Origanum vulgare* L. (not yet in flower), *Poterium sanguisorba* L. and *Calamintha Acinos*

Clairv. It was particularly gratifying to find several plants of *Geranium columbinum* L., which seems to be rather rare in the East Riding. *Malva moschata* L. just coming into flower also flourished near Weedley and near Eastdale, also *Atropa Belladonna* L. and *Bryonia dioica* Jacq. The abundant wild strawberry plants had produced a particularly heavy crop of fruit and it was interesting to note that a few plants of *Geum rivale* L. growing among the chalk-loving plants on the railway bank were as well developed as those in the low marshy ground nearby. The particularly wide distribution of *Koeleria gracilis* Pers. attracted attention and other species noted on the chalk included *Brachypodium pinnatum* (L.) Beauv., *Cerastium arvense* L. and *Pimpinella Saxifraga* L. A copse in Drewton Dale, a small marsh, and cornfields were also visited.

Some 150 species were noted in all, which in addition to the above included :

<i>Papaver dubium</i> L.	<i>Galium verum</i> L.
<i>Fumaria officinalis</i> L.	<i>Valerianella olitoria</i> Poll.
<i>Reseda lutea</i> L.	<i>Carduus nutans</i> L.
<i>Silene Cucubalus</i> Wibel.	<i>Cirsium palustre</i> Scop.
<i>S. noctiflora</i> L.	<i>C. vulgare</i> (Savi) Airy-Shaw.
<i>Stellaria graminea</i> L.	<i>Centaurea scabiosa</i> L.
<i>Arenaria serpyllifolia</i> L.	<i>Hieracium Pilosella</i> L.
<i>Hypericum perforatum</i> L.	<i>Leontodon hispidus</i> L.
<i>H. hirsutum</i> L.	<i>Orchis Fuchsii</i> Druce
<i>H. quadrangulum</i> L.	<i>Triglochin palustre</i> L.
<i>Linum catharticum</i> L.	<i>Carex panicea</i> L.
<i>Ononis repens</i> L.	<i>C. hirta</i> L.
<i>Melilotus officinalis</i> Lam.	<i>C. flacca</i> Schreb.
<i>Anthyllis vulneraria</i> L.	<i>Bromus erectus</i> Hud.
<i>Agrimonia eupatoria</i> L.	

Bee Orchis was searched for in vain, and other species recorded along this route in recent years but not noted on this excursion include *Gentiana amarella* L. and *Orchis pyramidalis* L.

**Bryophyta** (R. Lewis) : From a bryologist's point of view the South Cave meeting was extremely poor. Most of the country covered was in the open and much too dry for bryophytes. The following species, all very common ones, were noted in a disused quarry near the railway east of South Cave station :

<i>Ceratodon purpureus</i> Brid.	<i>Encalypta vulgaris</i> Hedw.
<i>Barbula convoluta</i> Hedw.	<i>Webera nutans</i> Hedw.
<i>Barbula unguiculata</i> Hedw.	<i>Bryum argenteum</i> L.
In addition the following were noted along and near the railway between South Cave station and East Dale :—	
<i>Dicranum scoparium</i> Hedw.	<i>Brachythecium purum</i> Dixon.
<i>Fontinalis antipyretica</i> L.	

It must of course be admitted that due to the general dryness of the ground covered and the late season no serious effort was made to collect bryophytes. Although searched for, no hepatics were noticed. A visit earlier in the spring would certainly have brought forth better results.

**Ornithology** (R. Chislett) : It was interesting to see parts of this south-west spur of the Wolds, with its sand-quarries tenanted by Sand Martins, its chalk hills and dales with gushing spring and some woodland. A long list of birds was not expected but 38 were noted, including those two species I always expect in Wold country, Corn Bunting and Tree Sparrow. Several Turtle Doves were seen, but the following only occurred once :—Lesser Redpoll, Sedge Warbler, Blackcap, Mistle Thrush, Wheatear, Green Woodpecker, and an immature Common Gull. Lapwings were already in flock (some 80 birds) on the cultivated stony high ground, whence an extensive view was obtained in the direction of York, Selby and across the Humber. Four young Common Whitethroats were ringed. Others birds seen were of common species and call for no comment.

**Diptera** (C. A. Cheetham) : The weather was not helpful to the entomologists for though fine there was no sunshine and butterflies and hover flies were very



scarce. By sweeping in the quarry and lane sides and especially by the stream side a fair number of Diptera were collected.

Amongst the larger Craneflies were the two common species of *Tipula*, *oleracea* L. and *lateralis* Mg. and also *unca* Wied. (*longicornis* Schum.) and *fascipennis* Mg., one species of the black *Ptychoptera paludosa* Mg. and odd specimens of *Limnophila discicollis* Mg., *Dicranomyia autumnalis* Staeg. and *Erioptera taenionota* Mg.

Amongst the Empids the large species *E. tessellata* F. and *E. livida* L. were plentiful with an odd *E. lutea* Mg.

With the common *Dolichopus unguulatus* L. were two unusual species, *D. claviger* Stan. and *D. longicornis* Stan. and the small *Sympycnus annulipes* Mg. and *Syntormon pallipes* F. Other small flies were *Themira putris* L., *Sepsis nigripes* Mg., *Nemopoda stercoraria* Dsv., with the mud-loving *Parhydra quadripunctata* Mg. Sweeping the grass and reeds on the stream side resulted in taking *Tetanocera elata* F., *Pherbina coryleti* Scop. and *Limnia unguicornis* Scop., *Liogaster metallina* F., *Syrirta pipiens* L., *Ascia podagrica* F., *Nemotelus nigrinus* Flin. and *Chrysopilus cristatus* Verr. On the vegetation in the quarry the showy *Chloromyia formosa* Scop. occurred fairly often and the large black *Dioctria rufipes* Deg. once. Amongst smaller types were *Coenosia rufipalpis* Mg., *Pipunculus zonatus* Ztt. and *P. extricatus* Coll.; the latter has not been recorded for the county previously but has probably been included in records of *P. rufipes*.

### Lepidoptera (Joyce Sykes):

Meadow Brown.	<i>Maniola jurtina</i> L.	
Small Heath.	<i>Coenonympha pamphilus</i> L.	Very common.
Small Copper.	<i>Lycaena phlaeas</i> L.	
Common Blue.	<i>Polyommatus icarus</i> Rott.	Very common.
Large Skipper.	<i>Ochlodes venata</i> Brem. & Grey.	Fairly numerous.
Red Admiral.	<i>Vanessa atalanta</i> L.	

No 'Whites' were seen and there were few 'Vanessids.'

Yellow Shell.	<i>Larentia bilineata</i> L.	Very common.
Silver Ground Carpet.	<i>L. montanata</i> L.	Very common in shade.
Yellow Underwing.	<i>Triphaena pronuba</i> L.	
Cinnabar.	<i>Hipocrita jacobaeae</i> L.	
Burnished Brass.	<i>Plusia chrysitis</i> L.	

Few caterpillars were found and although the Ragwort was plentiful only one Cinnabar caterpillar was seen.

### SLINGSBY, July 5th

IN a period of broken weather we were fortunate in getting a fine day for this meeting. Although fine there was a cool, strong wind and insects were not numerous, but in sheltered corners of the wood the troublesome woodland flies, *Hydrotaea irritans*, were a nuisance.

Our guide, Mrs. E. Brown, led us first to Slingsby Bank Wood, where a good deal of timber had been felled and much of the rough area adjoining had been ploughed out during the war. The lake at Castle Howard attracted the bird lovers and botanists; this was two and a half miles from Slingsby but the results show the effort was worth while.

At the meeting, where Mr. Ralph Chislett took the Chair, nine Societies responded to the roll call. Mr. J. Utley voiced the thanks of the Union to the landowners and the shooting tenant, Mr. T. E. Rickatson, who gave a generous permission, and the meeting thanked Mr. G. B. Walsh for making the necessary arrangements and Mrs. Brown for her help and guidance.

**Flowering Plants** (E. R. Cross): The most interesting species were seen at Castle Howard lake where *Pilularia globulifera* L. is abundant. Here also were seen *Scutellaria galericulata* L., *Lycopus europaeus* L., *Acorus Calamus* L., *Alisma Plantago-aquatica* L. and *Sparganium ramosum* L., with masses of the introduced *Nymphoides peltatum* (S. G. Gmel.) Rendle and Brit., in full bloom. *Hypericum pulchrum* L., *H. acutum* Moench., and *H. humifusum* L. were also noted and the

sedges seen included *Carex vesicaria* L., *C. rostrata* Stokes, *C. hirta* L., *C. flacca* Schreb. and *C. binervis* Sm. Fine specimens of *Lactuca macrophylla* A. Gray were gathered on a hedge bank.

**Mosses** (C. A. Cheetham): The moss flora was rather disappointing, the dominant species being *Dicranella heteromalla* Schp., and *Mnium hornum* L., with *Hypnum cupressiforme* L. on the tree stumps and *Catharinea undulata* W. and M. on clayey soil. More interesting species like *Mnium affine* Bland., *M. undulatum* L., *Thuidium tamariscinum* B. and S. were only seen in odd corners. *Eurhynchium striatum* B. and S. and *Brachythecium rutabulum* B. and S. (fruiting) were more frequent. The most interesting species was the small *Seligeria recurvata* B. and S., which was on a lump of sandstone in the old quarry or entrenchment.

**Ornithology** (R. Chislett): The 50 species of birds observed, with one exception (Black-necked Grebe), included nothing which might not be expected in the area. Not a Wagtail was seen. Spotted Flycatchers were numerous, but neither the Pied Flycatcher nor the Nuthatch were noted. An odd Great Spotted Woodpecker was the only member of its order. By the lake at Castle Howard were Mallard, Lapwing, Moorhen, Coot, Little and four Great Crested Grebes, Lesser Black-backed Gull, and remains of a Common Gull were picked up. J. P. Utley had good views of a Black-necked Grebe before the main party reached the lake. Game birds were few. Other species noted were Carrion Crow, Rook, Jackdaw (numerous), Magpie, Jay, Starling, Greenfinch, Goldfinch, Linnet, Chaffinch, House Sparrow, Yellowhammer, Reed-Bunting, Skylark, Tree-Pipit, Tree-Creeper, Great Tit, Blue-Tit, Willow-Warbler, Wood-Warbler, Sedge-Warbler, Blackcap, Common Whitethroat, Song-Thrush, Blackbird, Redstart, Robin, Hedge-Sparrow, Wren, Swallow, Martin, Sand-Martin, Swift, Cuckoo (young and adult), Mute Swan, Wood Pigeon, Stock Dove, Turtle Dove, Curlew, Pheasant.

**Diptera** (C. A. Cheetham): When looking for two-winged flies the low brambles at the entrance of the wood suggested a habitat for the rarer species of *Pachyrhina*, but few were caught. *P. guestfalica* Westf. was the most interesting, the other being *flavescens* L. *Tipula scripta* Mg. was plentiful with the smaller *Limnobia trivittata* Schum. and *Tricyphona immaculata* Mg. In a sheltered hollow a few hoverflies were about, including the large *Sericomyia borealis* Fln., *Volucella pellucens* L., *Eristalis tenax* L. and *horticola* Deg., *Syrphus ribesii* L. and *balteatus* Deg. *Xylota segnis* L. was often on large leaves in the sunshine with the red-bodied *Beris vallata* Forst. and small *Microchrysa cyaneiventris* Ztt. *Thereva nobilitata* F. and *bipunctata* Mg. were caught here with the large *Empis tessellata* F. and smaller *lutea* Mg., *Leptis nigriventris* Lw., *trigramma* Mg. and *lineola* F., the red-legged *Bibio pomonae* F. and *lepidus* Lw. Along the roadway one found wet places and here the shining Dolichopods were plentiful, *Dolichopus popularis* W., *griseipennis* Stan., *brevipennis* Mg., *longicornis* Stan., *Gymnopternus aerosus* Fln., *Sympycnus annulipes* Mg., *Chrysotus neglectus* W., *Psilopus platypterus* Fab. and the small *Parhydra quadripunctata* Mg. Amongst the yellow species were *Tetanocera elata* F., *Helomyza similis* Mg., *Scatophaga suilla* F., *Sapromyza vorida* Fln., *Rhyphus fenestralis* Scop. and *Palloptera ustulata* Fln. The blacker species were *Hylemyia lasciva* Ztt., *nigrimana* Mg., *Coniosternum obscurum* Fln. and *Phryxe vulgaris* Fln. The most interesting species caught were *Pipiza bimaculata* Mg., *Pipunculus zonatus* Thoms., and possibly *melanostolus* Beck. *Tephritis bardanae* Schr., the long-bodied *Lissa loxocerina* Fln. and *Chyliza leptogaster* Pnz.

Nineteen of these insects are additions to the Diptera list of V.C. 62.

**Lepidoptera** (Joyce Sykes): The day, though sunny, was far too windy to be congenial to most butterflies and moths.

The few seen or taken were:

#### BUTTERFLIES.

Large Skipper.	<i>Ochlodes venata</i> Br. and Grey.	Very common in sheltered spots.
Meadow Brown.	<i>Maniola jurtina</i> L.	Very common in sheltered spots.
Ringlet.	<i>Aphantopus hyperantus</i> L.	Several specimens seen.

## MOTHS.

Yellow Shell.	<i>Larentia bilineata</i> L.	
Silver Ground Carpet.	<i>Larentia montanata</i> L.	
Clouded Magpie.	<i>Abraxas sylvata</i> Scop.	Several in Slingsby Bank Wood.
Oak Tortrix.	<i>Tortrix viridana</i> L.	Hovingham High Wood and Slingsby Bank Wood.
Six-spot Burnet.	<i>Anthrocera filipendulae</i> L.	
Golden Plusia.	<i>Plusia moneta</i> Fab.	Cocoon on <i>Delphinium</i> in the garden of the Grapes Inn.
Light Emerald.	<i>Metrocampa margaritaria</i> L.	Hovingham High Wood.

It was interesting to note that in the avenue of limes at Castle Howard almost every leaf on each tree was damaged. The leaves were examined and the green caterpillars of a noctuid moth were found. An attempt has been made to rear these caterpillars but has failed. I understand that this eating and sometimes stripping of the limes has been going on for almost thirty years and probably longer. I should be very interested to know which moth causes the damage.

## BURTON LEONARD, July 19th

AT Burton Leonard we had good weather but insects were not abundant. The old limestone quarries provided good ground for botanists and entomologists and would repay a series of visits at different dates.

At the meeting in the evening our Vice-President, Mr. Ralph Chislett, took the Chair and eight Societies responded to the Roll Call. During this season's excursions 23 out of the 35 Societies have been represented on one or other occasion.

**Flowering Plants** (C. M. Rob) : The disused limestone quarries were by far the best ground for flowering plants ; almost all the species listed in the circular were seen, many of them in some quantity, especially *Blackstonia perfoliata* (L.) Huds., and *Asperula cynanchica* L. *Carex ericetorum* Poll. was over, but a few spikes were found in sufficiently good condition to be recognisable. *Anacamptis pyramidalis* (L.) L. C. Rich., and *Coeloglossum viride* (L.) Hartm. were plentiful in the turf round about the quarries proper, the former also in the broken ground of the quarried area.

The outstanding find of the day was a single plant of an *Epipactis*, at the edge of one quarry. The plant was left, but three flowers and a single leaf were taken for verification. These were sent to Mr. Summerhayes at Kew, who names the plant *Epipactis atropurpurea* Raf. A further note on the occurrence of the species in this district appears elsewhere in this issue.

The lake at Copgrove was dry, but on the muddy parts formerly submerged were *Hippuris vulgaris* L., *Ranunculus sceleratus* L., *Gnaphalium uliginosum* L., and *Nasturtium palustre* (Leyss.) DC.

Some members got as far as Foster Flat, but not to the right area, as none of the listed plants were observed, and lack of time prevented a detailed examination of the ground. *Carex lepidocarpa* Tausch., *C. hostiana* DC., *C. disticha* Huds., *Thalictrum flavum* L., and *Alchemilla vestita* (Buser) Raunk., were some of the most interesting plants of this area.

Other plants seen on the outing included *Allium Scorodoprasum* L., *A. oleraceum* L., *Lysimachia nummularia* L., *Silene flavescent* Bernh., and *Rosa arvensis* Huds.

**Mosses** (C. A. Cheetham) : A good deal of interest was shown in the Bryological Section and we were fortunate in finding *Thuidium hystricosum* Mitt. fairly plentiful. There was also a little *T. Philiberti* Limpr. On rubble by the old lime kilns we got *Leptobryum pyriforme* Wils. mixed with masses of *Funaria hygrometrica* Sibth., *Ceratodon purpureus* Brid., *Dicranella heteromalla* Schp. and *Trichostomum crispulum* Bruch. On damp spots at the foot of the quarried face were *Mnium affine* Bland., *M. undulatum* B. & S., *Brachythecium rutabulum* B. & S., *B. purum* Dixon., *Amblystegium serpens* B. & S., *Encalypta streptocarpa*



Hedw., and a little *Tortula aloides* De Not. Nearer Copgrove Hall Mrs. Appleyard got *Pottia intermedia* Fuern.

**Fungi** (W. G. Bramley) : The rain of the previous week produced a number of the larger fungi but only one of these was definitely identified. Rusts and smuts were not greatly in evidence.

#### MYXOMYCETES.

*Lycogala epidendrum* Fr.

#### PHYCOMYCETES.

*Peronospora effusa* (Grev.) Rabenh., on *Chenopodium*.

#### ASCOMYCETES.

*Erysiphe graminis* DC., conidia on Oats, Barley.

*Lachnella sulphurea* (Pers.) Quel., on Umbellifer.

*Ophiobolus rubellus* (Pers. ex Fr.) Sacc., on Umbellifer.

*Diatrype disciformis* (Hoffm.) de Not., on *Acer*.

#### BASIDIOMYCETES.

*Ustilago longissima* (Sow.) Tul., on *Glyceria aquatica*.

*U. perennans* Rost., on *Arrhenatherum*.

*Puccinia hieracii* Mart., II on *Hieracium* sp.

*P. obtegens* Tul., O.II on *C. arvense*.

*P. poarum* Niels., O.I on *Tussilago*.

*P. taraxaci* Plowr., II on *Taraxacum*.

*P. veronicae* Schroet., on *V. montana*.

*P. violae* (Schum.) DC., II, III on *V. Riviniana*.

*Phragmidium sanguisorbae* Schroet., II, III.

*Hygrophorus chlorophanus* Fr.

#### HYPHOMYCETES.

\**Periconia byssoides* Pers.

\*Not in Mason & Grainger for V.C. 64.

**Ornithology** (R. Chislett) : A fine warm day wound up the year's field meetings (mycology excepted) in an attractive district and ended with a good tea. An old quarry, particularly in magnesian limestone, in which tall and small bushes and a variety of plants occur, is usually attractive to birds ; and in such we saw Tree-Sparrow, Bullfinch, Tree-Pipit, Great Spotted Woodpecker, and Turtle Dove. In the woods along the Bottoms to Copgrove Hall occurred Jay, Tree Creeper, Blackcap, and Little Owl. With the Mere empty, ducks were absent and only the Moorhen present. Other species noted were Rook, Jackdaw, Greenfinch, Chaffinch, House-sparrow, Yellowhammer, Skylark, Great and Blue Tits, Spotted Flycatcher, Willow Warbler, Whitethroat, Missel-thrush, Song-thrush, Blackbird, Robin, Hedge-sparrow, Wren, Swallow, Martin, Swift, Young Cuckoo (which was ringed and being hedge-sparrow reared), Kestrel, Wood-pigeon, Snipe, Common Gull, Moorhen, Pheasant and Partridge.

**Diptera** (C. A. Cheetham) : Diptera were not plentiful but one species of the gallmakers was an addition to the Yorkshire list, *Tevellina (Trypeta) serratulae* L. Others belonging to this group were *Urophora solstitialis* L., *Orellia (Trypeta) tussilaginis* F. and *Xyphosia (Tephritis) miliaria* Schrnk. The only species of *Tipula* that was caught was *T. lateralis* Mg. It was on the damp pastures below the quarries. Other members of this section were *Pachyrhina histrio* F. and *Limnophila lucorum* Mg. Amongst the Dolichopods, *Hercostomus germanus* W. was most plentiful with the smaller species *Chrysotus neglectus* W., others on this damp corner were *Limnia unguicornis* Scop. and *Scatella stagnalis* Flin. Two species of Empids were *Empis livida* L. and *E. lutea* Mg. Hover flies were represented by *Myiatriopa florea* L. and *Ascia podagrica* L. *Sepsis punctum* F., *Palloptera umbellatarum* F., *Chlorops scalaris* Mg. and *Meromyza variegata* Mg. were fairly plentiful.

**Lepidoptera** (Joyce Sykes) : The day was hot and very suitable for the flight of butterflies. The numbers were greater than any observed this year, although disappointing compared with 1946.



## BUTTERFLIES.

Green-veined White.	<i>Pieris napi</i> L.	Very common.
Small White.	<i>P. rapae</i> L.	A few reported.
Meadow Brown.	<i>Maniola jurtina</i> L.	Very common.
Small Heath.	<i>Coenonympha pamphilus</i> L.	Common.
Small Tortoiseshell.	<i>Aglais urticae</i> L.	More common than previously noted in 1947.
Peacock.	<i>Nymphalis io</i> L.	Very scarce.
Common Blue.	<i>Polyommatus icarus</i> Rott.	Very common in quarry.
A Dark Green Fritillary was reported.		

## MOTHS.

Silver Y.	<i>Plusia gamma</i> L.	Two in quarry.
Six-Spot Burnet.	<i>Anthrocera filipendulae</i> L.	Several in quarry though not abundant.
Yellow Shell.	<i>Larentia bilineata</i> L.	
Large Emerald.	<i>Geometra papilionaria</i> L.	One in wood near Copgrove.
Yellow Tail.	<i>Euproctis similis</i> Fuessly.	
An Antler moth was reported from the quarry.		

**Freshwater Biology** (H. Whitehead): Two objects of interest were the stream at the 'Bottoms' and a pond between Burton Leonard and Copgrove.

The stream bed consisted of large pebbles and small boulders, some of which were covered by a filamentous alga. No submerged mosses were seen. A specimen of the alga was submitted to Mr. Malins Smith, who identified it as *Cladophora glomerata*. He added the following note: 'It was in a special condition, the cells being very thick-walled and, no doubt, full of reserved food. I have never seen a specimen with such thick walls before. This means that it is in the "akinetes" condition, one that one would associate with a resting period for the alga and with lower and slower water than usual in the stream. As usual the older walls of the alga are covered with diatoms, these being of the genus *Cocconeis*. There are enormous numbers of these on the specimen.' The water level appeared to be a little below normal, though there was a steady flow in the stream.

Many of the stones had attached to them large numbers of empty pupal cases of the microcaddis *Hydroptila*. Unfortunately, it is impossible to determine the species on such evidence. Of the other caddises, pupae of *Rhyacophila* sp. and *Stenophylax* sp. were seen. Nymphs of the Mayflies *Ecdyonurus* and *Baetis* were fairly common. *Gammarus pulex* was abundant. Some village boys said that crayfish ('little lobsters') were to be found, but none were forthcoming on this occasion.

The pond was fairly large and surrounded by trees, making it difficult to estimate its size. Small crustacea were represented by *Daphnia pulex* (very common), *Cyclops* sp. and ostracods.

A number of 'Phantom larvae' were netted, bred out and identified by Mr. Cheetham as *Sayomyia plumicornis*.

A few Corixids were submitted to Mr. J. M. Brown who noted the following species: *Corixa punctata* (Illig.), *C. sahlbergi* (Fieb.) and *C. nigrolineata* (Fieb.).

My thanks are due to Messrs. Malins Smith, Cheetham and Brown for examining specimens and for their identification.

The Universities Federation for Animal Welfare has issued a revised and extensively rewritten edition of their pamphlet on **Instructions for Dealing with Rabbits**. A campaign for the destruction of rabbits has become a matter of some agricultural urgency, since the damage done by these animals far outweighs any food value they may have. The pamphlet gives full technical details about fumigation, ferreting, shooting, long-netting, rabbit-proofing, and other humane methods of clearance. Sporadic destruction to scattered farms is deprecated as a waste of effort in view of inevitable reinfestation and a co-ordinated plan of campaign under every Agricultural Executive Committee is urged. The pamphlet costs threepence and may be obtained from U.F.A.W., 284 Regent's Park Road, Finchley, London, N.3.

## In Memoriam

JOHN A. HORNE

(1926-1947).

TRAGEDY can seldom have been so poignant as in the sudden death from poliomyelitis of this most promising young field botanist. On August 10th he was in full health, having recently spent a holiday in the Lake District, where he had gathered several species of plants he had not seen before. On August 16th he passed away. Thus was cut short a career of much actual accomplishment, but of even greater promise.

He was primarily a field botanist, and this interest seemed to be a family inheritance. His mother's uncle, Mr. W. Copley, botanised extensively in the Shipley district and left a considerable herbarium. John's mother was able to interest him, at the early age of ten, in her uncle's plants and in efforts to dry plants for himself. The interest thus early called forth grew rapidly with the years. Through his father's friendship with Mr. S. Jackson, of the Cartwright Hall, Museum, Bradford, John began in 1939 to attend the Museum talks on Natural History and later accompanied Mr. Jackson on his excursions to gather plants. He soon joined the Bradford Naturalists' Society as a junior member and in 1942, when this Society was hard hit in its membership by the war, he became our Recording Secretary and gave us invaluable service until he left for Sheffield early in 1946. His grasp of the various subjects (he had quite a respectable knowledge of Entomology), the accuracy and reliability of his recording and his keen interest in Natural History were remarkable, and particularly so as he was still a schoolboy.

He joined the Y.N.U. in 1944 and became a member of, and a regular contributor to, its Plant Records Committee. Details of his contributions can be seen in the annual reports of that Committee for the last three years. One of his characteristics was the care he took in producing perfect specimens for his herbarium. No trouble was too great to effect this and his collection was a pleasure to examine.

He entered Salt's School, Shipley, in 1936 with a County Minor Scholarship and in July, 1943, passed his Higher Certificate Examination with special credit in Chemistry. He then held a State Bursary at Leeds University, studying Metallurgy, in which he obtained his B.Sc. degree, conferred in January, 1946. He next got a post as Assistant Metallurgist with the firm of Newton Chambers & Co., Sheffield. Here he threw himself vigorously into the work of the recently formed Works Natural History Society, to which he contributed two papers during his short period with the firm.

He had a specially attractive personality, frank, friendly and reliable. His keenness, persistence and helpfulness in the field made him an ideal companion on outdoor rambles. Nor was he in any way narrow in his interests. Besides having a good knowledge of sciences outside Natural History, he had home and church interests in which he occupied himself with his characteristic enthusiasm.

To the present writer, who had some part in guiding John's early efforts in naming plants and saw his rapid development with growing pleasure, his loss is severe; what it must be to his parents and sister, fiancée and closer friends cannot be fathomed.

A. M. S.

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We have received the July and August numbers of the new issue of **Nature Lover**, a popular monthly magazine of the countryside, the publication of which was interrupted by the war. It contains short non-technical articles covering all branches of natural history and country life and includes amongst its contributors Brian Vesey-Fitzgerald, Hugh Newman, Frances Pitt and J. Z. Young. There are 52 pages per issue, 12 of which are on art paper for photographs. These include excellent illustrations of butterflies, Pine Marten, Black-Headed Gulls, Octopus and Cuttlefish and other subjects in the two numbers received. The magazine is published by Staples Press Ltd., Staples House, Cavendish Place, London, W.1, the subscription rate being 16/6 post free per annum or 1/3 per issue.

## BOOK REVIEWS

**Trail of the Money Bird**, by **Dillon Ripley**. Pp. 336 with 18 photographic illustrations. Longmans, Green & Co., 15/-. 'We have acquired a 59-foot schooner which we plan to sail out to Dutch New Guinea and spend about a year cruising around the coast and small islands nearby. The Academy of Natural Sciences of Philadelphia is very interested in the idea and wants us to make bird collections for them. We need a zoologist and wondered if you would care to go.' It is not given to many naturalists to receive such an invitation. When Ripley finally parted from his friends to return to America he had made such good use of his time that in addition to hundreds of skins, he had 42 cages containing living birds, mostly rare species and some the first of their kind to reach America alive. The feeding and maintenance of this collection during the long return journey was not the least formidable of the many problems and difficulties associated with a journey which lasted over a year and a half and covered 30,000 miles. Most of the collecting was done in North-west New Guinea and the adjacent islands; difficult country to traverse where only the coastal areas are at all well known and the penetration of a hinterland populated by tribes some of which are still more than suspected of cannibalism, is a risky undertaking. On the Tamrau Mountains, Ripley broke new ground and found the remarkable bower birds, which build houses of twigs surrounded by a neat garden to which collections of fresh flower heads are brought daily and arranged in heaps according to colour. Several species of paradise birds were collected, appropriately called 'money birds' by the natives, though the export of plumage is now forbidden by the Dutch Government, and some interesting facts are given about the habits of these and other species encountered. Students of bird behaviour cannot fail to be interested, for example, in Ripley's observation that the intensity of courtship displays in the birds of paradise which he saw were proportionate to the wealth of plumage of the species. But the author has avoided overloading his story with ornithological matter and his book is primarily a personal narrative about the places visited and the peoples encountered in the course of a journey to one of the least-known parts of the world, and as such can be read with interest and enjoyment by anyone with a taste for travel literature.—W.A.S.

**British Sea Birds**, by **C. A. Gibson-Hill**. Pp. 144 with 48 plates of photographs, a frontispiece in colour, numerous pen and ink sketches and maps, all by the author. Witherby. 18/-. Here is a book which should be in the hands of every bird lover, whether he is a keen student of ornithology or one who just loves to hear birds sing and watch their varied flight, particularly of those that 'swing in from the sea.' Twenty-four sea birds, all of which breed in the British Isles, are dealt with fully. No ducks, grebes, divers or shore waders are included, but only birds which one feels have the 'tang' of the sea about them, though the author admits that the Black-Headed Gull is more of a land bird than some of those omitted. The chapter on 'Field Characteristics' is valuable for reference and here are notes on a further 26 species which do not breed with us. There are also brief remarks on 12 species (including the extinct Great Auk) which can only be classed as very rare vagrants.

The author has intimately studied the birds he describes and has achieved a wonderful understanding of their lives and habits, form and colouring, voice and flight, and the growth from newly-hatched chick to adult. This knowledge is imparted to the reader in a delightful manner with no 'padding'; it is simple, direct and very human: consequently, the book can be read and richly enjoyed by all who have an interest in sea birds. The author's humour will bring a smile or a chuckle at several places in the book while the short paragraph at the end of each description giving, as far as possible, the origin or derivation of the name of the bird is interesting.

The 93 photographs finely illustrate the book and indicate the time, patience and understanding used by the author in many parts of the British Isles. The pen and ink sketches in the descriptions and the maps in the chapter 'Field Characteristics' are splendid in bringing out points the author wishes to emphasise.

British ornithologists will feel it a loss, after reading this book, that Mr. Gibson-Hill is now in Singapore as Director of Ornithology at the Raffles Museum.

They will hope that when on a visit to this country he will give us a companion volume. Messrs. Witherby are to be commended on the first-rate production of this very valuable book.—J.P.U.

**Wonders of Wild Flower Life**, by **F. Martin Duncan**. Pp. 160 with 33 plates. Sampson Low, Marston & Co., 15/-. The particular wonders described in this book cover seasonal growth responses, insectivorous habits, pollination mechanisms, climbing and twining plants, symbiosis, parasitism and saprophytism, and seed and fruit dispersal. The plants selected in illustration of the author's theme are largely British, but their scientific names are repeatedly spelt incorrectly. It is written in a very simple style which frequently verges on the lyrical and sentimental and the outlook towards the structures and responses described is tarred throughout with the brush of teleology. We doubt the publishers' claim that this book will appeal to all lovers of the countryside. It has irritated one at least who enjoyed Mr. Duncan's zoological works and regrets his incursion into the field of botany.—W.A.S.

## CORRESPONDENCE

*To the Editor of 'The Naturalist.'*

SIR,

### PROPOSED BRITISH HERPETOLOGICAL SOCIETY

At an informal meeting held at the British Museum (Natural History) on April 10th, 1947, it was decided to attempt the formation of a 'British Herpetological Society.' The society would be formed with a view to increasing our present knowledge and promoting interest in various aspects of herpetology which, it is felt, have been somewhat neglected, its main objects being:

- (1) To encourage the study of the ecology, life histories, habits and distribution of the Amphibia and Reptiles, and of the British species in particular.
- (2) To publish annually a report on the work of the society, and to review briefly advances in knowledge, particularly in the field of ecology.
- (3) To hold meetings, when possible, for the reading of papers and the discussion of problems relating to herpetology.
- (4) To record and compile information on the various aspects of the subject covered by the society.

Although such a society would, of necessity, be concerned mainly with the study of British species, foreign membership would be most welcome. It is suggested that the annual subscription to the society, including a free copy of the report, should be ten shillings.

The undersigned would be most grateful if all those interested in the formation of this society will send in their names to Capt. J. D. Romer, 96 Mortlake Road, Kew, Surrey, and request that this may please be brought to the notice of your readers. If the response is sufficiently large, further steps will be taken to inaugurate the society and individuals will be informed accordingly.

H. W. PARKER.  
MALCOLM SMITH  
ANGUS BELLAIRES.  
J. W. LESTER.

MAXWELL KNIGHT.  
ALFRED LEUTSCHER  
J. D. ROMER.

[This letter was received too late for inclusion in our July issue.—Ed.]



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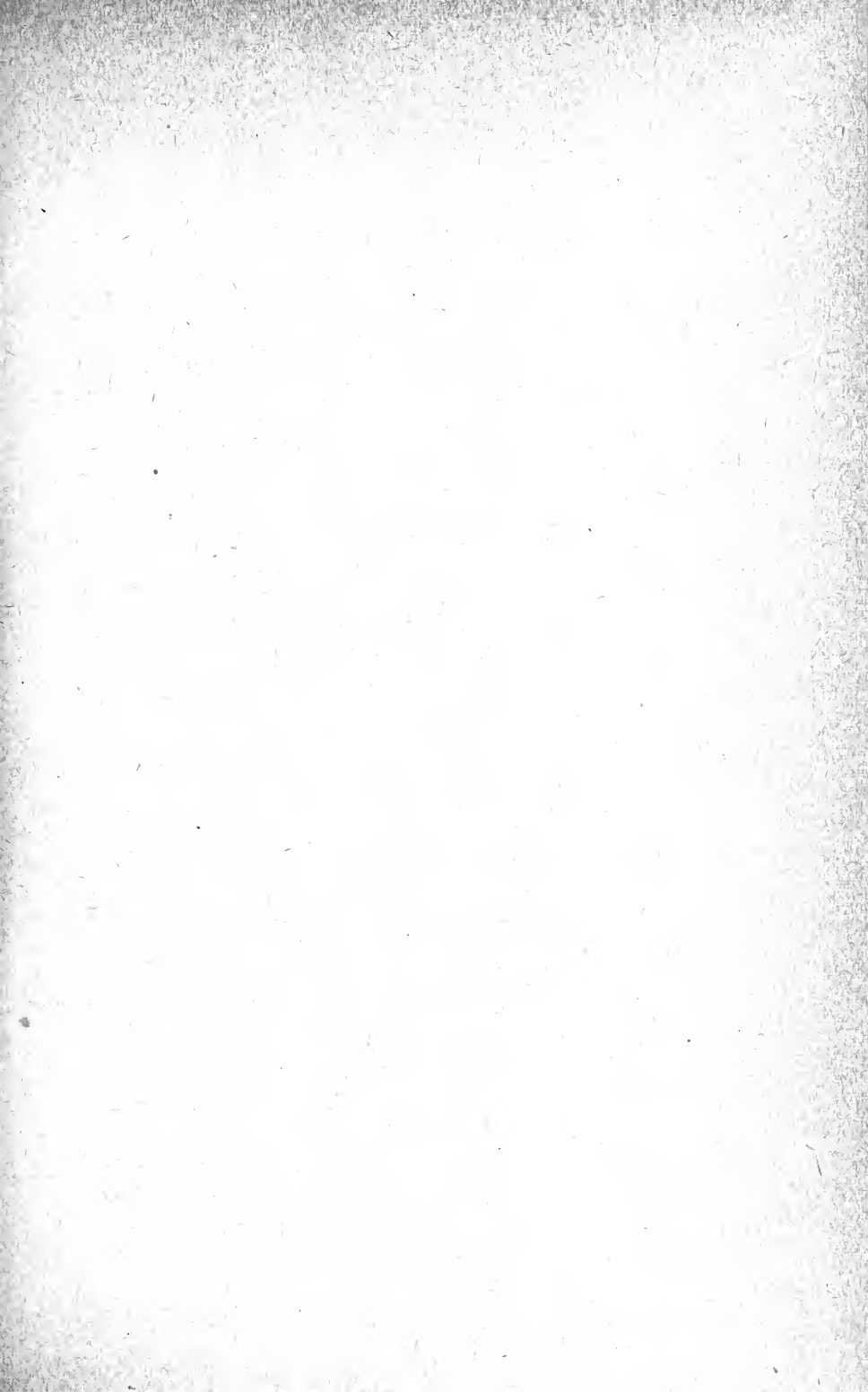
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## The 484th Meeting

WILL BE

## THE SPRING FORAY

For the Study of Micro-Fungi

IT WILL BE HELD AT

# Sheffield University

## From APRIL, 8th to 12th, 1948

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### SECTION OFFICERS.

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**HEADQUARTERS.**—The Botany Department of the University will be open for microscopic work by permission of the Registrar and Professor Clapham.

**ACCOMMODATION** will be reserved in Crewe Hall, one of the Residential Hostels of the University. Single bedrooms will be available. Terms, 14/- per day for Bed, Breakfast, Sandwiches or Lunch and Dinner.

Ration books and not Emergency cards must be brought by members. They are requested to bring own soap, but not towels.

Requests of reservation of room should be sent to Dr. T. E. T. Bond, Botany Dept., Sheffield University, Sheffield 10, not later than March 29th. Reservations not taken up must be cancelled by April 4th, otherwise a booking fee of 5/- is charged.

Crewe Hall is situated at the junction of Clarkenhouse Road, Westbourne Road and Brocco Bank. It may be reached by public transport as follows :

- (a) From L.M. & S. Railway Station take No. 9 Circular Bus to Red Lane at entrance to Crewe Hall. Service every 15 minutes.
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- (c) Those who wish to obtain a taxi should telephone Taxi Rank at Barkers Pool (Tel. 25308) if one is not available at the station.

**EXCURSIONS.**—Friday, April 9th, Roche Abbey.

Members wishing to join this excursion please communicate with Dr. T. E. T. Bond, Botany Dept., The University, Sheffield 10, before the end of March.

Saturday, April 10th. The Limb Brook or other woods on the western boundaries of the city. Accessible by public transport service.

**MICROSCOPES** will be available in the Laboratory.

**MAPS.**—1 in. O.S. 103, 111 (new edition) or the ' Peak District ' Sheet.

**BOOKS** will be available at the Laboratory.

Keen beginners in the Study of Micro-Fungi will be welcomed.

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**The Next Meeting** will be the Whitsuntide week-end, May 15th to 17th, 1948, at Thirsk for Gormire and Pilmoor.



# Yorkshire Naturalists' Union.

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## The 485th Meeting

WILL BE HELD AT

# THIRSK V.C. 62

## For Gormire district and Pilmoor

### ON WHIT-WEEKEND

## MAY 15th to 17th, 1948

---

**HEADQUARTERS.**—Golden Fleece Hotel, Market Place, Thirsk. (Tele phone : Thirsk 3108.)

**TERMS.**—Probably 23/- per day. Members should apply before May 1st as accommodation is limited, and should state they are Members of the Y.N.U.

**TRAVEL.**—Thirsk is on the main York-Darlington and Leeds-Thirsk branch lines. And may be reached by bus from Leeds, York, Harrogate, Scarborough, Middlesbrough and Ripon. Summer time-tables are not yet available. A private bus has been booked to convey the party from Thirsk to each day's starting point. Approximate charge, 2/6 per day inclusive.

**ASSEMBLY.**—Members will assemble each morning at 10 a.m.

**ROUTES.**—Saturday, May 15th : by bus to Boltby, up Gurtof Gill to Wood, returning *via* Lunshaw Gill to Boltby Village. Sunday : by bus to Pilmoor and Sessay Wood. Monday : by bus to Sutton under Whitestone Cliff, thence by way of Low Cleaves to Gormire, return by bus from Sutton Bank Foot.

**MAP.**—1" Ordnance Map, Sheet 22 (Pickering-Thirsk) shows the area covered by the excursion.

**PERMISSION.**—Permission to visit has been very kindly granted as follows :

Gurtof, by Mrs. Place.

Lunshaw, by Forestry Commission.

Gormire, Whitestone Cliff and Garbutt Wood, by Thornton Waltass Estate.

Cleaves, by G. H. Rob, Esq.

Sessay Wood, by Captain Blow.

Pilmoor, by Christian Faith Society and Sir Clive Coates.

Members are requested not to disturb game or interfere in any way with the nests of game or other birds.

**No dogs** are allowed on any of the areas covered by the above permissions.

Members are requested to close all gates.

**GEOLOGY.**—Dr. H. C. Versey, F.G.S. : The area between Gormire and Boltby is made up of rocks of the Middle and Upper Jurassic System which show strong contrast in lithology. The steep slopes of Whitestone Cliff, due to the Lower Calcareous grit of the Corallian Series, have been disturbed by frequent landslips, one of which has dammed up Gormire. The lake is both fed and emptied by drainage through slipped material. The lower slopes of the escarpment are occupied by the deltaic sediments of the Middle Jurassic with their limestone intercalations and with the calcareous or ferruginous and pebbly Dogger at their base. The Dogger is well seen in the quarry at Cleaves while Gurtof Gill shows a succession from the Lias clays (at Boltby) up to the Grey Limestone. Records of limestone beds in the lower part of the Gill would be valuable for the Hydraulic Limestone and Millepore Bed which are known near Gormire have not been recognised near Boltby.

The area lies near the eastern margin of the ground covered by the Vale of York, ice and drift with erratic blocks can be traced up to 600 feet. Overflow channels in parallel sequence are seen in many of the spurs near Gormire and west of Boltby.

**BOTANY.**—C. M. Rob, F.L.S. : The last visit of the Union to this part of the North Riding was in 1887, more than sixty years ago, and there will be many changes to record, unfortunately not for the better. Gurtof has changed little, and we may hope to find most of the plants listed in the circular of 1887, *i.e.* *Primula farinosa* L., *Trientalis europaea* L., *Anagallis tenella* L. and *Narthecium ossifragum*. Lunshaw Gill has been planted with conifers, and *Antennaria dioica* (L.) Gaertn. has not been seen for some years. *Corydalis claviculata* (L.) DC. which seems to be a recent introduction to the valley is frequent, probably introduced with the young trees. The late Wm. Foggitt has no record of the plant occurring on the west side of the Ridge.

Gormire has changed a little ; *Potamogeton gramineus* L. is no longer here. There is still plenty of *P. alpinus* Balb., *Pilularia globulifera* L. has increased considerably, especially at the south end of the lake. Other plants we may expect to find are *Viola palustris* L., *Apium inundatum* (L.) H. G. Rchb., *Lysimachia thyrsiflora* L. and *Littorella uniflora* (L.) Asch. At Little Gormire the pond in the valley to the west of the main lake are *Hottonia palustris* L. and *Peplis portula* L. *Asplenium Adiantum-nigrum* L. is on the cliffs overlooking the lake. Pilmoor has suffered from a general drying up (see *Naturalist*, 1947, p. 15) and many of the characteristic plants of wet places are no longer to be found. *Teesdalia nudicaulis* (L.) Br., is still in some of the dry sandy parts of the moor, *Rhamnus Frangula* L.,

*Sparganium minimum* Fr., and *Calamagrostis epigeios* (L.) Roth. are other plants of this area.

Sessay Wood has been felled during the last fifteen years. Previous to this *Paris* and *Convallaria* grew here. *Sorbus intermedia* grows in a nearby hedge.

**DIPTERA.**—Chris. A. Cheetham : Gormire is a good place for the smaller midges and Dr. Edwards and I spent some time here in 1927 and the list of captures will be found in *The Naturalist*, 1927, p. 60. Amongst the larger species the gadflies, *Theriopectes bisignatus* Jaen. and *Haematopota crassicornis* Whlbg. may make themselves felt. The dronefly, *Eristalis sepulchralis* L. is a rarity found here, so are *Helophilus transfugus* L. and *lineatus* F., *Xylota sylvarum* L., *Sericomyia borealis* Flin. and *lappona* L.

At Pilmoor two mosquitoes may be troublesome, *Aedes annulipes* Mg. and *Culex punctor* Kirby (*nemorosus*) and gadflies, *Haematopota pluvialis* L. and *Theriopectes montanus* Mg. There is an interesting Tipulid here, *Pachyrrhina scurra* Mg. and some reed borers, *Elgiva albiseta* Scop., *lineata* Flin. and *Sepedon spegeus* F.

**MAMMALIA.**—J. P. Utley, B.Sc. : Most of the common wild animals should be seen during the weekend. Fox may be disturbed at Pilmoor and Gurtof but no record of Badger is to hand. Grey Squirrels will probably be seen but a record should be made of the location of any Red Squirrels seen. A look-out should be kept at Pilmoor for water-loving mammals.

**REPTILIA.**—J. P. Utley, B.Sc. : The Viper and Grass Snake have been recorded from all areas likely to be visited.

**ORNITHOLOGY.**—J. P. Utley, B.Sc. : A useful list of species should be compiled during the weekend but for none of the areas for which permission to visit has been granted can birds be classed as numerous although the variety of species may be there. The bulk of the summer visitors should be at their breeding locations and a goodly number of nests ought to be found. Both Mallard and Teal are known to breed at Pilmoor, Woodcock and Nightjar may be found in Gurtof area and Goldfinches might be seen. It is considered that not many predatory birds will be seen but Kestrel and Sparrow Hawk should be noted and Merlin should not be ruled out. The Tawny Owl, Barn Owl and Little Owl are all likely and possibly Long Eared Owl. It is hoped that notes will be taken of all Grey Wag-tails and Dippers seen for it is thought these species are not so common as in the Western Dales.

**PILMOOR (General Note).**—J. P. Utley, B.Sc. : The area covered comprises about 120 acres and is the last remaining uncultivated or unplanted portion of the South Lacustrine Plain. In soil types it can be divided into three distinct areas : (i) peat marsh and bog of which approximately 9 acres are classed as open water, the largest 'pond' being 5 acres ; (ii) the biggest area, consisting of a very thorough mixture of peat and fine sand ; and (iii) comprising the slightly elevated portions and composed almost wholly of fine sand. The three areas are considerably broken and intermixed but the formation differences remain very distinct. Underlying probably the whole is a layer of clay ; the adjacent brick-works, long disused, testify to this.

Excepting the ponds, nearly the whole area is tree or shrub covered. Birch, chiefly hybrids between *Betula alba* and *B. pubescens*, is by far the most abundant tree, so much so that a casual glance would assume that there was nothing else but Birch. Closer inspection shows quite a number of big Oaks on the drier portions, and many seedlings. Ash is scarce ; there are a few Poplars, one or two Sycamores, but no Elms. There is an occasional Alder apart from the small clump near the church. Of evergreens there are two full-grown Scotch Pine and one young one about 7 feet high, one Holly and, in the church close, a few *Cupressus* and one

Scotch Pine. The church, situated by the roadside, is isolated and serves farms scattered over a wide area.

Willow, in several forms, is the most common shrub, then comes Hawthorn, a few of which have attained a large size. An odd Rowan tree may be found, also a few Blackthorn and a fair quantity of Alder Buckthorn. Only two Hazel bushes have been located and very few Elderberry. Twisting about many of the shrubs and on the ground is a quantity of Honeysuckle.

As undergrowth, dwarf Willows are abundant and on the drier portions are Bramble with a few Wild Rose. The drier peat areas are covered with *Calluna*, some of it very old, and *Erica*. There is much Bracken on the peat and sand areas, and, in Summer, large portions of the marsh ground are white expanses of Cotton Grass. Ferns are not plentiful.

During recent years a number of shooting butts have been erected west of the large pond and around these Rhododendrons have been planted. These shrubs have borne fruit and seedlings are to be found at many places on the Moor.

Last year was drier than usual and it affected the area so much that in early Winter the only stretch of open water remaining was an extent of about half an acre in the south-east corner. Apart from seasonal effects there is considerable evidence that the Moor is drying-out very slowly; perhaps the most noticeable being the decadence of the Birch—a number of trees are dying—and the growing ascendancy of the Oak. This may be partly due to the more intensive cultivation of the surrounding land, but the extensive growth of Birch may be the main factor. Local opinion is emphatic that the district is now much drier than it was at one time.

Fifty-nine species of birds were recorded during last year, eight of mammals, and two of reptiles. No birds were numerous; at the peak of activity even the ubiquitous Willow Warbler was heard only occasionally.

Fox (alive and dead), Stoat, Brown Rat, Mole, Water Vole, Water Shrew, Hare and Rabbit were the mammals seen. Viper and Grass Snake were the two reptiles.

**LEPIDOPTERA (Pilmoor only).**—Mrs. K. G. Payne; K. G. Payne, B.Sc., A.R.C.S.; J. P. Utley, B.Sc.: The following species were recorded during 1947:

(i) **BUTTERFLIES.**—Large White (*Pieris brassicae*), Small White (*P. rapae*), Green Veined White (*P. napi*), Orange Tip (*Euchloe cardamines*), Clouded Yellow (*Colias edusa*), Small Tortoiseshell (*Aglais (Vanessa) urticae*), Painted Lady (*Pyrameis cardui*), Red Admiral (*P. atalanta*), Wall Butterfly (*Pararge megera*), Meadow Brown (*Epinephele lavira (jurtina)*), Ringlet (*Aphantopus hyperantus*), Small Heath (*Coenonympha pamphilus*), Small Copper (*Heodes phloea (chrysophanus)*), Common Blue (*Polyommatus (Lycaena) icarus*), Large Skipper (*Angides sylvanus*), Marbled White (*Melanargia galathea*), and Dark Green Fretilly (*Argynnis aglaia*). The last two species were the most unusual; neither of these was captured or taken, but both were definitely identified. The Wall Butterfly and the Small Copper were both seen as late as October 26th.

(ii) **MOTHS.**—Cinnabar (*Hypocrita jacobaeae*), Clouded Buff (*Diacrisia sannia*), Grey Dagger (*Apatele psi*), Silver Y (*Plusia gamma*), Large Emerald (*Geometra papilionaria*), Common Carpet (*Epirrhoe alternata*), Yellow Shell (*Euphyia bilineata*), Silver Ground Carpet (*Xanthorhoe montanata*), Chimney Sweeper (*Odaxia atrata*), Willow Beauty (*Cleora rhomboidaria*), Common White Wave (*Cabera pusaria*), Pebble Hook Tip (*Drepana falcatoria*), and Five Spot Burnet (*Zygaena trifolii*). No doubt the list would be considerably extended if a few night visits could be made.

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**Meeting.**—A General Meeting will be held at 5-45 p.m., Monday, to receive reports from the various sections and to elect new members.

**The Next Meeting** will be at Malham, June 5th.



# Yorkshire Naturalists' Union.

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## President:

WILFRID BACKHOUSE ALEXANDER, M.A. Oxford.

## Hon. Treasurer:

S. D. PERSY FISHER, Sackville Street, Leeds, 7.

## Assistant Treasurer:

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

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## The 486th Meeting

WILL BE HELD AT

# MALHAM

On SATURDAY, JUNE, 5th, 1948

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**HEADQUARTERS.**—Sparth House, Miss S. B. Smithson. Tea: plain, 2/-; with egg, 2/6; meat tea, 3/6. Bed and breakfast, 7/6. Full board, 15/-.

**BUSES.**—These leave Skipton at 9-30 a.m. and 12-25 p.m. and return buses are 6-43 p.m. and 9-13 p.m., taking invest minutes on the journey.

Trains are available to Bell Busk which is five miles from Malham by a pleasant walk via Kirk Stile, Airton and riverside to Hanlith and Malham. The 6-10 a.m. Leeds would give time to join the first bus party and the 10-35 a.m. Leeds would give time for the second bus party. There is a 7-29 p.m. return train. If the Secretary knew the number it might be possible to have extra room available on the buses.

**ROUTES.**—A party will leave at 10-15 a.m. and go via Gordale and upstream to the head of the stream at Great Close Mire then to Tarn Foot, Water Sinks, and join the next party at the Cove.

The second party will leave at 1-15 p.m. for the Cove where they will meet the others and return for tea.

**THE DISTRICT.**—Malham is a district that attracted naturalists from early times. The scenic wonders of Gordale and the Cove are seen as one approaches from the south and they have as buttresses the unbedded reef limestone mounds of Cawden and Wedber with their well-known stations for fossils. To the north

the Mid-Craven Fault has given the Cliffs of the Cove and Gordale and above them an extensive area of Great Scar limestone up to the North Craven fault which brings up the Silurian rock floor of Malham Tarn. These Silurian rocks are seen at the head of Gordale Beck and give rise to marshy areas with their interesting plants. This varied countryside provides habitats for a flora that attracted botanists prior to the visit of John Ray in 1671 when he saw Jacob's Ladder at the Cove, for this was given by Merrett in his *Pinax Rerum Naturalium Britannicarum*, Lond., 1666.

Some of the plants mentioned by Ray are the Baneberry, Wall Draba, Lesser Meadow Rue and Horseshoe Vetch.

At a later date it was evidently known for its Mosses and Lichens. We read of three Todmorden bryologists—Hanworth, Greenwood and Nowell (working men, as they termed themselves in a letter to W. Wilson, *Naturalist*, 1882-3, p. 151)—finding *Cinclidium stygium* in 1836, the first British record for this moss.

The source of the water which issues at the Cove was naturally thought to be the Tarn but it has been traced to the Smelt Mill and other sinks to the west. The water from the Tarn reappears at Aire Head Springs downstream from Malham village.

**GEOLOGY.**—Mr. W. S. Bisat writes: Malham lies on Carboniferous Limestone, and the knolls of Cawden and Wedber to the east of the village are highly fossiliferous, long lists of the contained fauna (mainly brachiopods) being given in the paper by Garwood and Goodyear (*Q.J.G.S.*, Vol. LXXX, pp. 239-242). These knolls form part of the Craven reef-belt, in which the rounded knoll-like outline of the hills contrasts with the regularly bedded scarp of the higher hills to the north, with the line of the Middle Craven Fault running east to west between the two. The cause of the change in topography at or near the fault line has been discussed and illustrated by Hudson (*Trans. Leeds Geol. Assoc.*, Vol. V, p. 53, fig. 2, and *Proc. Leeds Phil. Soc.*, Vol. IV, Part III, Plate 1), the latter paper also giving a detailed geological map of the district (*op. cit.*, fig. 1, p. 227).

Goniatites may be found in occasional pockets in the knoll limestones. These pockets have yielded *Goniatites hudsoni* on the south-east side of Cawden, and *G. wedberensis* on Wedber Brow, whilst from higher beds at Black Holes (half a mile south of the village), *G. crenistria*, *Beyrichocratoides truncatum* and other species have been obtained. These goniatites are characteristic of various horizons in the B<sub>2</sub>-P<sub>1</sub> goniatite succession.

The limestone is succeeded by the Bowland Shales, from which solid specimens of *Eumorphoceras pseudobilingue* have been obtained in Cow Close Sike, whilst the shales of Moor Close Gill near Bordley are the type locality for *Cravenoceras malhamense*. In the latter area, which is north of the Middle Craven Fault, there occur the highest beds of the limestones of the northern facies, including the *Orionastrea* band (Garwood and Goodyear, *op. cit.*, p. 227).

The area is a classic one for the study of underground water channels. In 1899 members of the Yorkshire Geological Society carried out extensive experiments in tracing the course of the water which disappears underground at Malham Tarn Sink. They came to the unexpected conclusion that the bulk of the water does not re-appear at Malham Cove as might be expected, but at Aire Head Springs to the south of the village. The water issuing at Malham Cove is apparently derived in the main from the country to the west, including Smelt Gill Sike (*Proc. Yorks. Geol. Soc.*, Vol. XIV, pp. 36-37).

**ENTOMOLOGY AND FRESHWATER BIOLOGY.**—J. M. Brown: There is plenty of opportunity for entomologists to add to our knowledge of the insect life of the Malham district as entomologists in general seem not to have been attracted to the district. At any rate our records for the area are very meagre. No notes of insect life were given at all in the circular of the 1925 meeting, and very few records seem to have been published since. Exception must be made, however, in respects of those orders of insects which pass their early life in water—Stoneflies, Mayflies and Caddis-flies, these have received a considerable amount of attention, and the district affords good opportunities for their study, for in

addition to the Tarn, the various streams are rich in insect larvae and nymphs, especially the stream flowing from the Cove. The upper part of Gordale Beck being strongly calcareous is less rich. Among the *Plecoptera* (Stoneflies), *Perla carlukiana* and *P. cephalotes* (our two largest species) occur, though *Perlodes mortoni* has not been taken. I have records of twelve species including the less common *Amphinemura standfussi*. Among the *Ephemeroptera* (Mayflies) thirteen species are recorded of which *Ameletus inopinatus* is certainly the most interesting. The nymph occurs plentifully in the stream below the Cove, though the adult fly has not been taken. *Habrophlebia biafusca*, *Centroptilum pennulatum* and *Ecdyonurus dispar* also occur. Thirty species of *Trichoptera* (Caddis-flies) have been already noted. *Phrygania varia* occurs by the Tarn. *Stenophylax latipes*, *S. stellatus*, *S. permistus*, *Sericostoma personatum*, *Silo nigricornis*, *Lepidostoma hirtum*, *Odontocerum albicorne*, *Tinodes dives*, *Lype phaeopa*, *Metalype fragilis*, *Glossosoma boltoni* and *Agapetus comatus* are the most interesting seen about the streams. I have records of about fifty species of *Hemiptera*, mostly common ones. From a pool on Kirkby Fell I have the following *Corixas*, *C. panzeri*, *C. striata*, *C. falleni*, *C. carinata* and *C. praeusta*. *Salda scotica* occurs by the stream sides. The best *Psocid* taken is *Epipsocus (Bertkauia) lucifuga* found under stones in Gordale.

**CONCHOLOGY.**—Mrs. E. M. Morehouse : The usual small *Helices* are to be found in and around Malham. In 1929 on the top of the Cove there were thousands of *H. nemoralis* L. in the crevices of the limestone paving, also a few *A. arbustorum* L. In the stream flowing from the foot of the Cove were to be found *L. pereger* Müll. A short distance away some very fine *Ancylus fluviatilis* Müll. were seen on stones in the flowing water.

Although the Tarn was well dredged only *L. stagnalis* L. (very small), *L. pereger* Müll., *P. albus* Müll were taken. It is possible a good list of molluscs may be made, as conditions in 1929 were very adverse, being cold and very windy.

**ORNITHOLOGY.**—E. Holmes : Malham district provided habitat suitable for many types of birds. In the valley from Jennets Fosse to Airton typical species of the stream, meadow and woodland are to be found. Although not worked thoroughly during the war years the following have been noted :—Dipper, Kingfisher, Common Sandpiper, Pied and Grey Wagtail, Redstart, Spotted Flycatcher, Tree Pipit, Green Woodpecker, Willow, Wood and Garden Warblers, Tree Creeper, Long-tailed Tit, Reed Bunting (Nr. Airton), and Herons from the Gargrave Heronry. Kestrels are not uncommon. The walk from Malham to the Tarn is full of interest. The face of the Cove provides a natural breeding place for Jackdaws, House Martins and an occasional Stock Dove, whilst on the higher meadows, Yellow Wagtails, Meadow Pipits are numerous and Wheatears nest amongst the limestone outcrop. Ring Ousels may be noted and Cuckoos are vocal everywhere. On the swamps the nesting season for moorland breeders should be well advanced. Eggs and young may be found of the Curlew, Snipe, Dunlin, Redshank, Green and Golden Plover. Ringed Plovers have been seen most years but proof of nesting not confirmed.

On the Tarn Mallard, Teal and Tufted Duck are resident while Coot, Waterhen, Dabchick and Great Crested Grebe nest in the reed beds. Black-headed Gulls are always in evidence and Herring Gulls and Lesser Black Backs have been noted.

The Carrion Crow has bred and other hill birds such as Raven, Merlin and Common Buzzard have been seen at intervals over a number of years.

**FLOWERING PLANTS AND FERNS.**—W. A. Sledge : The Malham area is rich in ecological and systematic interest. The dry limestone grasslands, calcareous marshes, limestone pavements and scars, and the aquatic vegetation of the Tarn each have distinctive floras, whilst the acidic peaty vegetation developed over the Silurian rocks west of the Tarn affords a striking contrast to the prevailing calcicolous communities. The species recorded from the district include many rare and interesting plants.

In the Tarn and its outlet stream the following Pondweeds occur :—*Potamogeton alpinus*, *P. gramineus*, *P. lucens*, *P. perfoliatus*, *P. nitens*, *P. praelongus*, *P. Zizii* and *P. Berchtoldii*. The other aquatic plants are *Callitriche stagnalis* and *Myriophyllum spicatum* with abundance of *Chara aspera* and *C. delicatula* and some *Littorella lacustris*. Plants thrown up on the shore should be examined for confirmation of the old record for *Callitriche autumnalis*. *Sagina ciliata* recorded from the shore of the Tarn should also be looked for.

The fenny marsh up the stream feeding the Tarn is of exceptional interest. It contains an abundance of *Carex paradoxa* (unknown elsewhere in Britain above 100 ft. O. D.) with *C. diandra*, *C. lasiocarpa*, *C. flava* and *C. disticha* forma *longibracteata*. The Marsh Cinquefoil and Bogbean are very common here and *Serratula tinctoria*, *Orchis latifolia* and *O. purpurella*, which hybridises with *O. Fuchsii*, and many other species including some uncommon mosses, are to be seen. The rare and distinctive *Euphrasia montana* grows in this marsh ; elsewhere on the moor as above Gordale, *E. micrantha* is the common Eyebright.

The rocky cliffs and slopes of Malham Cove and Gordale Scar and their neighbourhood are floristically very rich. On the edge of the scars and among the debris of the screes Ash, Rowan, Hawthorn, Hazel and Yew grow. The ground vegetation includes the following species :—*Thalictrum montanum*, *Actaea spicata*, *Cardamine impatiens*, *Draba muralis*, *D. incana*, *Cochlearia alpina*, *Thlaspi alpestre*, *Viola lutea*, *Polygala amara*, *Arenaria verna*, *Geranium sanguineum*, *G. sylvaticum*, *Hippocrepis comosa*, *Potentilla Crantzii*, *Saxifraga granulata*, *S. hypnoides*, *Ribes petraeum*, *Sedum Telephium*, *Circaea intermedia*, *Galium sylvestre*, *Antennaria dioica*, *Hieracium hypochaeroides*, *Primula farinosa*, *Polemonium caeruleum* (known at the Cove since 1666), *Blysmus compressus*, *Sesleria caerulea* and *Selaginella selaginoides*. The limestone pavements yield in addition to many of these, numerous ferns including *Asplenium viride*, *A. Trichomanes*, *Dryopteris Villarsii*, *Polystichum aculeatum*, *Cystopteris fragilis* and *Gymnocarpium Robertianum*. In one place above the Cove and growing in crevices of the limestone *Calamagrostis canescens* occurs, an unexpected species in such a habitat.

Other species of interest but of more local occurrence are *Hutchinsia petraea*, *Bartsia alpina*, *Rhinanthus spadicus* (*R. monticola*), *Carex capillaris*, *Equisetum variegatum*, *Polystichum Lonchitis* and *Ceterach officinarum*.

**BRYOLOGY.**—C. A. Cheetham : At Gordale and in other streams the var. *virescens* Schp. of *Hyppnum-falcatum* Brid. is plentiful and on masses of tufa *Weisia verticillata* Brid. may be found fruiting. In damp vertical limestone clefts we have *Eurhynchium Teesdalei* Schp. and *Seligeria pusilla* B. & S. Upstream, where the Silurian rocks appear, *Orthothecium rufescens* B. & S. is found and here and about Great Close Mire the curious fruits of *Amblyodon dealbatus* P. Beauv. are easily seen ; on the marshy places *Splachnum sphaericum* L. is often present. Nearer to Tarn Foot the marshy area has still *Cinclidium stygium* Swartz., with the similar looking *Mnium subglobosum* B. & S., and on the Tarn Moss is *Camptothecium nitens* Schp. with fruiting *Tetraphis pellucida* Hedw. and *Climacium dendroides* W. & M. This may have been the station for *Thuidium Blandovii* B. & S. which was possibly lost by the water level being raised when the Tarn was dammed at its outlet about the time of its finding.

On the limestone screes we get *Hylocomium rugosum* De Not. and *Cylindrothecium concinnum* Schp., and *Zygodon gracilis* Wils. is found on old walls. Below the Cove the *Fontinalis* has provided some problems in var. *laxa* Milde and *arvernica* Ren., see Dixon Moss Flora, p. 391.

**Meeting.**—This will be held at the Cafe following tea at 5-30 p.m. Reports will be presented by the various sections and the election of new members will take place.

The next meeting will be at Balne Ponds on the road between Selby and Doncaster on June 19th.



# Yorkshire Naturalists' Union.

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## General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Divisional Secretary:

Miss J. GRAINGER, Meltham.

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## The 487th Meeting

WILL BE HELD AT

# BALNE

For the investigation of the Ponds and the adjoining  
Moor (V.C. 63)

On SATURDAY, JUNE 19th, 1948

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**HEADQUARTERS.**—Whitley Bridge. The Cafe is at the moment changing ownership. Members wishing for tea please send a P.C. to the Local Secretary, Miss J. Grainger, Wilshaw, Meltham, Huddersfield, stating the kind of tea they would like (plain or meat) by June 10th.

**BUSES.**—Leeds (St. Peter's Omnibus Station) to Selby, hourly, 13 minutes to the hour.

York to Selby—12 minutes past each hour.

Selby to Balne—every hour on the hour.

Doncaster to Balne—15 minutes past the hour.

**RETURN.**—For Doncaster, from Whitley Bridge, 25 minutes past the hour.  
For Selby—every hour on the hour.

These services are all operated by the B. & S. Motor Service.

**LEADER.**—Dr. Sledge hopes to be present.

**PERMISSION** has been obtained from Mr. Grimshaw, The Grange, Balne, who requests that gates shall be used and not improvised ways through the hedges.

**MEETING.**—It is suggested that members meet at the cross roads at the Ponds at 1 p.m.

**BOTANICAL NOTES.**—Dr. Sledge writes : Balne Pond lies about midway between Doncaster and Selby and a little to the east of the main road. It is a large, approximately rectangular sheet of water divided diagonally into two parts by an embankment which carries the Hull & Barnsley railway line. The western half adjacent to the Heck road is botanically the more interesting of the two sections. There is a great quantity of *Carex Pseudo-Cyperus* here and other species present include *Hydrocotyle*, *Sium angustifolium*, *Oenanthe Lachenalii*, *Epilobium parviflorum*, *E. palustre*, *Samolus Valerandi*, *Alisma ranunculoides*, *Typha latifolia*, *T. angustifolia*, *Eleocharis palustris*, *Potamogeton coloratus* and *Carex Otrubae* (*C. vulpina* auct.). The mosses *Hypnum scorpioides* and *H. gigauteum* are both plentiful. The other half of the pond is less varied and has extensive sheets of *Equisetum limosum*.

There are sand and gravel pits at Heck and at Whitley Thorpe in which grow *Trifolium arvense*, *Ornithopus perpusillus*, *Anthriscus vulgaris*, *Anthemis arvensis* and many other species. *Teesdalia nudicaulis* is recorded for the Heck sandpits, but I have not seen it there.

**ORNITHOLOGY.**—Mr. Chislett writes : The area shown on the map as Balne Moor lies in the level (drained) country between the lower Aire and the Don, which extends southward across the Don, and Hatfield Chase and Thorne Waste, to the Lincolnshire fens. The main part of the area was covered in *The Naturalist* of January, 1940 (Birds about a part of the Southern County Boundary) ; and the suitability of immediate conditions will determine the local avi-fauna. The Willow-Tit should occur. Warblers should be numerous where cover is suitable. The presence of water will lengthen the list. The Quail was recorded as breeding in 1880.

**GEOLOGY.**—Dr. H. C. Versey writes : Most of the area is covered by alluvial and lacustrine deposits, but at Whitley Bridge, Triassic rocks appear as an island. On these rocks are sands and gravels of Pleistocene age and at the contact between these sands and the red sandstone of the Trias is a layer of pebbles showing fine examples of wind sculpture. These may be examined in the old gravel pit south of the station.

**MEETING.**—Tea will be arranged for 5-30 p.m. and will be followed by a meeting for presentation of reports on the day's work and for the election of new members to the Union.

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**The Next Meeting** is Filey on July 3rd.

# Yorkshire Naturalists' Union.

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## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Deputy Divisional Secretary :

G. B. WALSH, B.Sc., Scarborough.

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## The 488th Meeting

WILL BE HELD AT

# FILEY V.C. 61

## For Gristhorpe Bay

## On SATURDAY, JULY 3rd, 1948

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**TRAVEL.**—Gristhorpe is easily reached by buses on the route Hull, Bridlington, Filey, Scarborough. The summer time-tables are not yet out, but last year buses left Paragon Station, Hull, for Scarborough at least every hour. Between Bridlington and Scarborough there is a service every quarter of an hour, running alternately by East Yorkshire and United buses; return tickets are available on both services.

**ASSEMBLY.**—Members will meet at Gristhorpe Lane End at 11-30. Tea will be provided at Cayton Bay Camp Cafe at 5-30; price 3/6 to 5/-.

**ROUTE.**—Members will take the lane to Gristhorpe Bay to investigate the cliffs there; much of the venue is rough land, but it has been little visited by naturalists, even from Scarborough, and all information about it will be of interest.

In the Report by the Geological Sub-Committee of the Nature Reserves Investigation Committee on National Geological Reserves in England and Wales, a Conservation Area (Geological) is suggested 'Part of Gristhorpe Bay, including Yons Nab and Castle Rocks foreshore.'

'Lower, Middle and Upper Estuarine Series; important fossil plant beds in the Middle Series.'

**GEOLOGY.**—R. Giblett writes: *The coast from Cayton Bay to Filey Brig.* Cayton Bay is approached from the north by a notch, the result of a fault, across Osgodby Nab. The bay itself, a fine sandy one, is almost completely the result of faults which have carried the Millepore Beds to sea level at the two ends of the bay. This Millepore is the hardest bed on this part of the coast. At Yons Nab, at the south end of the bay, the Millepore overlies the Lower Estuarine Sandstones, followed in succession upwards by the Middle Estuarine, the Scarborough Limestone and Upper Estuarine, all on the shore, while the cliff above shows Cornbrash, Kellaways and Oxford Clay with the capping of Lower Calcareous Grit.

To the south the dip carries the Mid Jurassic rocks below sea level, in Gristhorpe Bay where the cliffs rise to about 250 feet. Kellaways and Cornbrash are both at sea level and the cliff above shows Oxford Clays and Lower Calcareous Grits capped by Boulder Clays. The Grits form almost vertical parts on the cliff while the Oxford Clays give rise to more gentle slopes. The jointed nature of the Grit sometimes gives rise to buttress-like formations.

It is in this cliff, in the Middle Estuarine Shales, that the famous Gristhorpe Plant Beds are located.

Filey Brig, which marks the southern end of the area, is composed of Lower Calcareous Grits and Coralline Oolites, capped, in the case of the cliffs, by Boulder Clays. The dip throws the north side of the Brig upwards as a barrier to the waves from the north and sea action has resulted in the formation of several small coves, here called 'Doodles.' The Ball Beds near the foot of the cliff are the source of the ball-like masses to be found in this part.

In the bay, to the south of the Brig, Boulder Clays of purplish colour form almost vertical cliffs, showing a remarkable example of gullying due to rain action.

**FLOWERING PLANTS.**—H. Rowntree writes: This area has not been worked by Scarborough botanists but the ground to the north and to the south has provided the following list:

*Cochlearia officinalis* L.

*Cakile maritima* L.

*Melilotis officinalis* Lam.

*Anthyllis Vulneraria* L.

*Poterium Sanguisorba* L.

*Parnassia palustris* L.

*Oenanthe aquatica* (L.) Poir.

*Daucus Carota* L.

*Scabiosa Columbaria* L.

*Eupatorium cannabinum* L.

*Pulicaria dysenterica* (L.) Gaertn.

*Cirsium eriophorum* (L.) Scop.

*Picris Echioides* L.

*Glaux maritima* L.

*Centaureum umbellatum* Gilib.

*Plantago Coronopus* L.

*P. maritima* L.

*Salsola Kali* L.

*Atriplex Babingtonii* Woods.

*Hippophae Rhamnoides* L.

*Gymnadenia conopsea* (L.) Br.

*Anacamptis pyramidalis* (L.) Rich.

*Triglochin maritimum* L.

*T. palustre* L.

*Phragmites communis* Trin.



**MOSSSES.**—Miss J. Robertson writes : There are no moss records from Gristhorpe but the following have been taken on the coast in the neighbourhood :

*Amblystegium filicinum* (De Not.) Cornelian Bay.  
*A. varium* Lindb. Cayton Bay.  
*A. serpens* B. & S. Cayton Bay.  
*Barbula unguiculata* Hedw. Cornelian Bay.  
*Brachythecium rutabulum* B. & S. Cayton Bay.  
*Bryum argenteum* L. Frequent near buildings and on roadsides.  
*Ceratodon conicus* Lindb. Cayton Bay.  
*Dicranella varia* Schp. Cornelian Bay.  
*D. varia* var. *tenuifolia* B. & S. Speeton.  
*Ditrichum flexicaule* Hampe. Filey.  
*Eurhynchium confertum* Milde. Cornelian Bay.  
*E. piliferum* B. & S. Cornelian Bay.  
*Fissidens bryoides* Hedw. Cayton Bay.  
*F. incurvus* Starke. Cayton Bay.  
*F. taxifolius* Hedw. Cayton Bay.  
*Mnium undulatum* L. Cayton Bay.  
*Pottia lanceolata* C.M. Cayton Bay.  
*Thuidium tamarascinum* B. & S. Cayton Bay.  
*Tortula muralis* Hedw. Filey.  
*Hypnum falcatum* Brid. var. *virescens* Schp. Filey.  
*H. polygamum* Schpr. Filey.

**INSECTA.**—G. B. Walsh writes : Very little is known about the insects. Two butterflies may be seen which are extending their range in the Scarborough district—the Grayling and the Marbled White, which has been taken by Mr. G. L. McDearnid at Cayton Bay.

The rocks on the shore would be worked for sub-littoral Coleoptera. *Aepus* and *Micralymna* have both been taken there. A cold chisel is used to prise up the rock-layers. Fortunately, the tide is going down so that conditions should be suitable about 2-30. *Nebria livida* has been taken at the base of the boulder clay by pulling away the layers of clay ; in the same way several species of *Bembidium* may be found, notably *Redtenbacheri* and *Stephensi* ; and a good look-out should be kept for species of *Bledius*. Sweeping the rough vegetation may be productive if the season is not an early one.

**BIRDS.**—Athol Wallis writes : The coast line from Filey Brig to Gristhorpe Bay is not a very productive area for bird life during July. Herring Gulls, Kittiwakes and Fulmars breed on suitable ledges where the cliffs are rocky but in Gristhorpe Bay these are mainly boulder clay and unsuitable. The most interesting feature is a Cormorantry just south of Gristhorpe numbering some twenty nests but it will be difficult to get within view of it owing to the high tide. During low tides some shore birds may be seen such as Oystercatcher, Curlew and Redshank. Various ducks frequent the bay during the winter months but July is not a likely month for seeing them. Razorbills and Guillemots may be seen on the water but they do not breed on these cliffs. Gannets have been seen flying past, Linnets, Rock Pipits, Yellow Bunting and an occasional Corn Bunting may be seen on the cliff tops.

**MEETING.**—A meeting will be held after the tea at Cayton Bay Camp Cafe which will be taken at 5-30 p.m. Reports on the excursion will be given by the various leaders and it is hoped that proposals for new members will be brought for election.

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**The Next Meeting** will be at Garsdale Head (Hawes Junction) on July 17th, 1948.



# Yorkshire Naturalists' Union.

---

## President :

WILFRID BACKHOUSE ALEXANDER, M.A. Oxford.

## Hon. Treasurer :

S. D. PERSY FISHER, Sackville Street, Leeds, 7.

## Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## Divisional Secretary :

Miss C. M. ROB, F.L.S., Catton Hall, Thirsk.

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## The 489th Meeting

WILL BE HELD AT

# GARSDALE HEAD

## On Saturday, JULY 17th, 1948

---

**HEADQUARTERS.**—Miss L. Thwaite, 4 Station Cottages, Garsdale Head, *via* Sedbergh.

**TRAIN SERVICE.**—An early train leaves Leeds 6-10 a.m., and Hellifield 8-10 a.m., arriving at Garsdale Head 9-16 a.m. But the main party on the 10-25 a.m. from Leeds arrive at 12-40. The return train leaves Garsdale Head 6-30 p.m.

**THE ROUTE** suggested is *via* the road to the Moor Cock and then the track towards Yore House and follow up-stream past Lunds Church, returning for tea at 5-30 p.m.

**THE DISTRICT.**—At Garsdale Head (long known as Hawes Junction) we are on the watershed of England, the stream at the station runs down to the Lune and Irish Sea. We are to walk over the slight rise to the north-east and down to the head waters of the Ure which ultimately runs into the North Sea.

The Union came to Hawes Junction in 1929, on which occasion Baugh Fell was investigated. The present meeting is to be devoted to the stream sides of the head waters of the Ure by Lunds Church and Shaw Paddock. Members who arrive on the early train will have time to walk on to Hellgill Beck, which is the commencement of the River Eden. The area all lies above the 1,000 ft. O.D. level and though the Garsdale side is in the West Riding and the Ure drainage is North Riding, the whole area is included in Watson's V.C. 65.

**GEOLOGY.**—Dr. Versey writes : The solid rocks of the area consist of the alternations of limestone, shale and sandstone which make up the Yoredale Series

with a capping of Millstone Grit on the hill tops. The main interest of the district lies, however, in the topography associated with the phenomena of river capture. Hell Gill, now the headwaters of the Eden, was once a tributary of the Ure, which lost it through the more vigorous erosion of the Eden. The Ure has also lost Grisedale Beck in competition with the Clough. Reference should be made to W. B. R. King, 'River Captures in the Lunds,' *The Naturalist*, 1924, pp. 41-44 and 81-83.

**BOTANY.**—Dr. Sledge writes : The most productive ground for the botanist is likely to be in the fields and about the riverside at Blades and Lunds between the Moorcock Inn and Hell Gill. Baker records *Hieracium prenanthoides* and *H. corymbosum* as plentiful on the banks of the Ure at Birk Rigg, and *Draba incana*, *Rubus saxatilis*, *Hieracium murorum*, *Galium sylvestre* and *Asplenium viride* at Hell Gill. I have not been over this ground during the summer and a full list of species would be of interest as so few records are available about the species in this area. *Orchis purpurella* occurs frequently by the Kirkby Stephen road and may be expected in the meadows as also may *Trollius*. On the railway embankment near the Inn I have seen *Primula farinosa*, *Rumex domesticus*, *R. domesticus* × *obtusifolius*, *Gymnadenia conopsea*, and *Botrychium Lunaria*. There is an old record by H. F. Parsons for *Draba muralis* from 'a rocky gill on right of road going up towards Baugh Fell from a point at Garsdale Head, a little to the west of the railway station.' I have looked for this without success, but a further search should, if possible, be made.

**MOSESSES.**—Chris. A. Cheetham writes : We are within a few miles of Uldale where *Anoetangium compactum* is so plentiful and fruits freely and this may be found in some of the gills on our walk. In Aisgill *Orthothecium rufescens* is very fine and should be sought in other places. On the moorland below Baugh Fell *Ditrichum homomallum* has been found and on sandy track sides the var. *ericoides* of *Rhacomitrium canescens* is often plentiful.

**COLEOPTERA.**—The late M. L. Thompson wrote : The Hawes Junction area is a favourable field for research to one in search of beetles characteristic of mountainous localities. *Aphodius borealis*, *A. lapponum* and *A. contaminatus* occur on the slopes of Baugh Fell. The moss near the edges of the upland streams is inhabited by *Diauna coenulescens*, *Lesteva monticola*, *L. punctata*, *Geodromicus plagiatus* var. *nigrita* and *Quedius auricomus* and on the margin of these streams *Bembidium paludosum*, *B. saxatile*, *B. atroviolaceum*, *Stenus guttata* and *Aegialia sabuleti*.

**LEPIDOPTERA.**—The late Rosse Butterfield said : The Antler Moth larvae often do considerable damage and an allied species *Celaena Laworthii* is abundant where the cottongrass grows. Other species which may be found are *Anthocaris cardamines*, *Chortobius pamphilus*, *Hepialus hectus*, *H. lupulinus*, *Arctia fuliginosa*, *Bombyx rubi*, *Rumia crataegata*, *Venusia cambrica*, *Acidalia aversata*, *Fidonia atomaria*, *Abraxus ulmata*, *Larentia didymata*, *L. caesiata*, *L. pectinitaria*, *Melanthia ocellata*, *Melanippe galiata*, *Coremia propugnata*, *C. ferrugata*, *Cidaria corylata*, *Acronycta rumicis*, *A. menyanthidis*, *Hadena glauca* and *Plusia gamma*.

**BIRDS.**—The district may repay the ornithologist with the sight of several birds of the mountains, the Raven should be seen and possibly the Buzzard and Peregrine. The Merlin and Short-Eared Owl nest here and Golden Plover are usually plentiful. Black-headed Gulls nest at tarns on the surrounding hills, where Dunlin and Snipe may be found. The Ring Ousel is on the more stony areas with the Wheatears and Curlew are widespread. Other species likely to be seen are Dipper, Sandpiper, Yellow, Grey and Pied Wagtails, Redstart, Spotted Flycatcher, Greenfinch with Magpie, Kestrel and Sparrow Hawk. Mr. J. P. Lewis and his Sedbergh confrères say Willow Warblers are very common and though Red Grouse are not as plentiful as formerly, probably due to disappearance of heather, there are several pairs of Black Grouse. He says the Kestrel, which used to be very noticeable in Garsdale, is now scarce there. They had seen a pair of Stockdoves in one of the smaller gills.

**MEETING.**—Meat Tea (3/-) will be taken at 5-30 p.m. and followed by a meeting to receive reports on the excursion and for the election of new members.



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Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

## General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

## The 490th Meeting

WILL BE THE

## FUNGUS FORAY

AT

# MASHAM

From September, 24th to 28th, 1948

*Chairman:* Mr. W. G. BRAMLEY, Bolton Percy.

*Recorders:* Mr. W. G. BRAMLEY, Spring Cottage, Pallathorpe, Bolton Percy, York.  
Dr. J. GRAINGER, Plant Pathology Dept., West of Scotland Agricultural College, Ayr.

*Convener:* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Mrs. C. F. Bruce, Silverdale House, Masham, Ripon.  
Terms 12/6 per day.

Members unable to get accommodation at Headquarters, which can only take 12- to 14 people, should write to Mrs. Harper, Ivy Dene, Masham. Terms about 14/- per day or The King's Head Hotel, Masham. Terms about £1 per day.

**WORKROOM.**—A good room is available at Headquarters. Members please bring their own books and microscopes.

**MEETING.**—The Annual Meeting of the Mycological Committee will be held on Saturday, September 25th, at 8 p.m., preceded by the Chairman's Address.

**Maps.**—Ordnance Survey, Sheet 21, one-inch.

**ROUTES.**—Swinton Park and Hackfall are to be the main collecting grounds. It is particularly desired to make comparison of this year's gatherings with that of last year in the case of Swinton Park which will probably be visited on September 27th by the kind permission of Viscount and Viscountess Swinton per Mr. J. P. Bradford.

**LEADER.**—Mr. W. A. Thwaites, the Masham Mycologist.

**EVENING MEETING.**—Mr. W. G. Bramley will speak to the Young Farmers' Club on Monday evening on 'Fungi and the Farmer.'

**The Next Meeting** of the Mycological Committee will be a Micro Foray with Headquarters at University College, Hull, April 8th to 11th, 1949. Terms 10/6 per day. The Secretary would like names of members who are intending to be present so that the University Authorities can make their arrangements.



# Yorkshire Naturalists' Union.

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# Sectional Meetings, 1948

OCTOBER, 2nd.—SECTIONAL MEETINGS. **Freshwater Biological Section** Annual Meeting, Leeds Church Institute, 4-30 p.m. The **Conchological Section** will meet in the Geological Department of the Leeds University. **Geological Section** Annual Meeting, Leeds Church Institute, 2-45 p.m.

OCTOBER 9th.—The **Botanical Section** will meet in the Hook Room, Leeds Church Institute, 5 Albion Place, at 3 p.m., to consider the Annual Report and nominate officers for the Section and its Committees.

OCTOBER 16th.—The **Vertebrate Section** will meet at Leeds Church Institute, 5 Albion Place, at 3 p.m. and 6 p.m. to consider the Report and nominate officers. This will be preceded by meetings of the Committees for Ornithology, Mammals, etc., and Wild Birds and Eggs Protection Acts Sub-Committee.

OCTOBER 23rd.—The **Entomological Section** Annual Meeting will be held at the Church Institute, Albion Place, Leeds. 3 p.m. to 5-30 p.m., Exhibits ; 5-30 p.m. to 6 p.m., Tea interval ; 6 p.m. to 8 p.m., approximately, Election of Officers, Records Reports, other business. Will members and visitors please bring exhibits. Tea will be provided but will all please bring food.

An **Executive Meeting** will be held in the Leeds Church Institute, Albion Place, Saturday, November 6th, 1948, at 3 p.m. Will all members of the Executive please make a note of this date and time.

The **Annual Meeting** of the Union will be held at Scarborough on December 4th, 1948.





## Yorkshire Naturalists' Union.

---

### President :

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### Hon. Treasurer :

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### Assistant Treasurer :

Miss L. M. ANDERSON, 48 Denton Avenue, Gledhow, Leeds, 8.

### General Secretary :

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

### Vice-Presidents :

PROF. W. GARSTANG, F.R.S., M.A., D.Sc., F.Z.S., Oxford.

EDWIN HAWKESWORTH, Cross Gates, Leeds.

T. PETCH, B.A., B.Sc., King's Lynn.

J. MEIKLE BROWN, B.Sc., F.R.E.S., Robin Hood's Bay.

W. S. BISAT, M.Sc., F.G.S., Collingham.

E. G. BAYFORD, F.R.E.S., Barnsley.

Prof. W. H. PEARSALL, F.R.S., D.Sc., F.L.S., London.

H. HAMSHAW THOMAS, M.B.E., F.R.S., M.A., Sc.D., F.G.S., Cambridge.

RALPH CHISLETT, F.R.P.S., M.B.O.U., Masham.

W. WATSON, D.Sc. (Lond.), A.L.S., Taunton.

H. C. VERSEY, D.Sc., F.G.S., Leeds.

PROF. A. C. HARDY, F.R.S., M.A., D.Sc., Aberdeen.

A. MALINS SMITH, M.A., F.L.S., Bradford.

J. WILFRID JACKSON, D.Sc., F.S.A., F.G.S., Buxton.

W. D. HINCKS, M.P.S., F.R.E.S., M.S.B.E., Manchester.

A. A. PEARSON, F.L.S., Hindhead.

Prof. W. G. FEARNSIDES, M.A., F.R.S., F.G.S., M.Inst.M.E., Sheffield.

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## The 492nd Meeting

AND

## The 87th Annual Meeting

WILL BE HELD AT

# SCARBOROUGH

in the

Lecture Room of the Public Library,  
by the invitation of the Scarborough Field Naturalists' Society,

On Saturday, December 4th, 1948

## Bus Services.

		<i>Depart</i>	<i>Arrive</i>
Hull to Scarborough ... ..	...	9.25 a.m.	12.5 p.m.
Scarborough to Hull ... ..	...	6.15 p.m.	8.53 p.m.
Middlesbrough to Scarborough ...	...	7.35 a.m.	10.30 a.m.
Scarborough to Middlesbrough ...	...	6.50 p.m.	10.0 p.m.
Bradford } Leeds } York }	Winter time-tables not yet arranged. Contact West Yorkshire Road Car Co., East Parade, Harrogate.		

## Train Services.

		<i>Depart</i>	<i>Arrive</i>
Middlesbrough to Scarborough ...	...	6.15 a.m.	9.25 a.m.
Scarborough to Middlesbrough ...	...	8.0 p.m.	11.14 p.m.
York to Scarborough ... ..	...	10.15 a.m.	11.24 a.m.
Scarborough to York ... ..	...	8.0 p.m.	9.0 p.m.
Leeds to Scarborough ... ..	...	9.15 a.m.	11.24 a.m.
Scarborough to Leeds ... ..	...	8.0 p.m.	10.2 p.m.
Hull to Scarborough ... ..	...	7.50 a.m.	10.2 a.m.
Scarborough to Hull ... ..	...	8.30 p.m.	10.10 p.m.

Bradford to Scarborough (L.M.S.)—Winter times not yet fixed.

## Details of Meetings.

- 11.30 a.m. Sectional or Committee Meetings in the Large Lecture Room in the Public Library.
- 12.0 noon. Executive Meeting in the Small Lecture Room.
- 1.0 p.m. Lunch at Rowntree's Café, 11 Westborough (almost opposite the Bar Church), 3/6 each. Will members taking lunch notify Mr. G. B. Walsh or the Secretary at once so that tables may be reserved.
- 2.0 p.m. General Committee (all members of the Union and delegates from Associated Societies).
- 3.0 p.m. Annual Meeting.

The Treasurer and Secretary will give their annual statements, and the President (Mr. W. B. Alexander, M.A. Oxford) will deliver his Presidential Address on Bird Observatories and Migration.

- 4.30 p.m. The Mayor and Mayoress will be pleased to invite the members of the Union to Afternoon Tea at the Town Hall. This is 5 minutes walk from the Public Library.

Will members of the **Executive** and **General Committee**, which includes all members of the Union and the Delegates of the Associated Societies, please note the above times. No further notice of these meetings will be sent.

*Hon. Secretary* : CHRIS. A. CHEETHAM.

505.42

# The NATURALIST

A QUARTERLY  
ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND

Edited by

W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

with the assistance as referees in special departments of

J. M. Brown, B.Sc., F.R.E.S.  
Chris. A. Cheetham, F.R.E.S.  
Ralph Chislett, F.R.P.S., M.B.O.U.  
Mrs. A. Hazelwood.

W. D. Hincke, M.P.S., F.R.E.S.  
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H. C. Versey, D.Sc., F.G.S.

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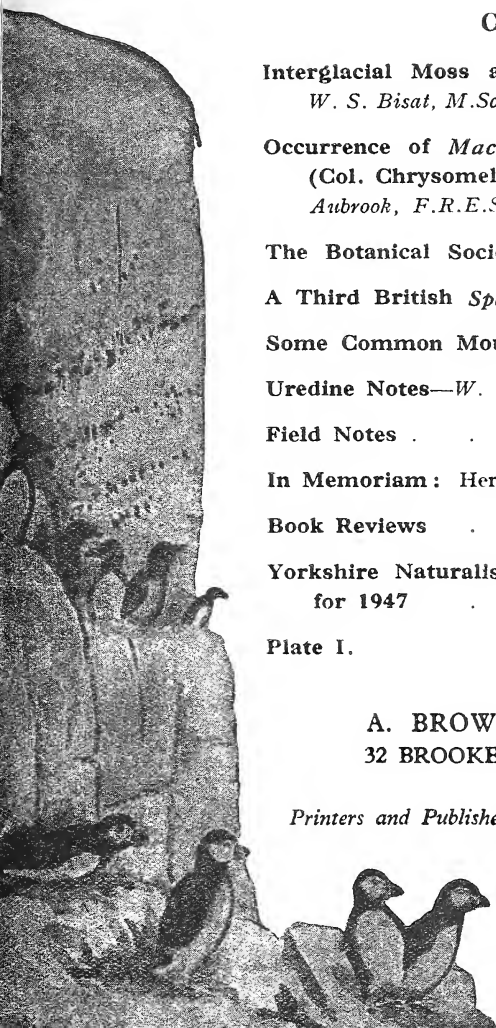
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## ENTOMOLOGICAL SECTION, LEPIDOPTERA COMMITTEE.

Would all members interested in Lepidoptera please submit a list of species seen or taken in their localities during the past year? Notes upon the status of even the common species would be appreciated. Any notes should be forwarded to the Recorder :—E. DEARING, 10 Bray Road, Speke, Liverpool 19.

---

### SPURN BIRD OBSERVATORY Warren Cottage Lettings for 1948

THE Committee desire to have the spring (March to late May) and the autumnal (end July to mid November) migration periods covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges will continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods of a week or longer please agree their periods with the Hon. Secretaries as early as convenient, giving if possible, alternative dates and periods? If this is done it will help those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period occupation, week-end residence, etc., can then be arranged for other helpers who should also apply early. In 1947, visits at short notice were often difficult to arrange and are likely to become more so. With five occupants the cottage is considered full.

J. LORD, 68 Wetherby Road, Acomb, York.

G. H. AINSWORTH, 144 Gillshill Road, Hull.

*Hon. Secretaries.*

---

Copies of Mr. A. A. Pearson's 'Notes on the Boleti' may be obtained from The Editors of *The Naturalist*, price 1/-, post free.

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### NOTICE.

Exchange copies of the following periodicals may be had on loan from The Editors of *The Naturalist*, The University, Leeds 2, on receipt of stamped addressed envelope :

*The Entomologist.*

*The Entomologists' Monthly Magazine.*

*Entomologists Record and Journal of Variation.*

*Essex Naturalist.*

*British Birds.*

*Irish Naturalists' Journal.*

*Journal of Conchology.*

*Science Progress.*

*The London Naturalist.*

*Transactions of the Lincolnshire Naturalists' Union.*

*Transactions of the British Mycological Society.*

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## FOR SALE BACK NUMBERS OF THE NATURALIST

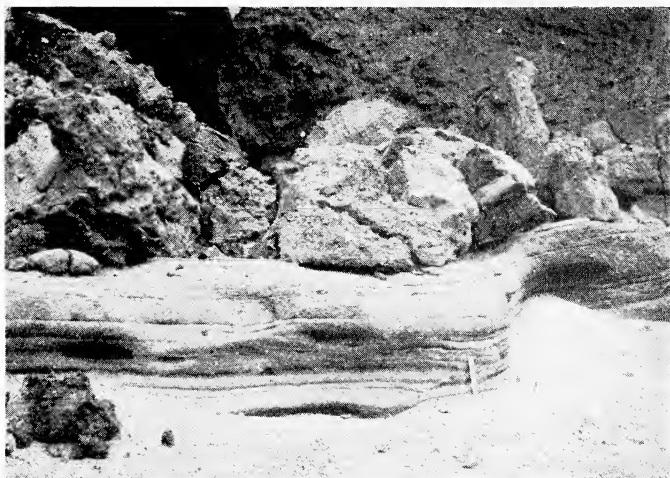
Complete sets are not available but numerous volumes from 1886-1905, and odd volumes and parts of other years, to 1932, can be supplied at 2/6 per volume or 6d. per part. Copies from 1933 can be supplied at cost price.

APPLY TO

**The Editors of the Naturalist, The University, Leeds, 2**



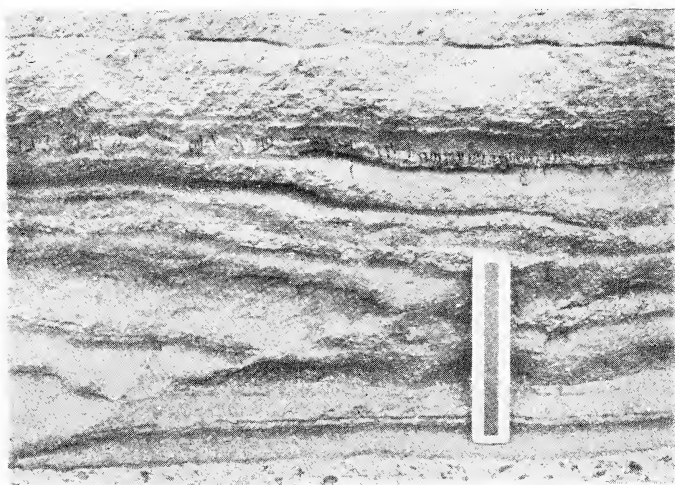




*Photo by]*

*[C. W. Mason*

FIG. 1.—Silt beds with moss laminae 500 yards north of Dinalington farm. Drab boulder-clay in background. The scale resting against the surface of the silts is 6 inches long.



*Photo by]*

*[C. W. Mason*

FIG. II.—Details of Fig. 1. The moss can be seen about 3 inches above the scale, as dark vertical filaments about half an inch long protruding from the silt.

# THE NATURALIST

FOR 1948

## INTERGLACIAL MOSS AT DIMLINGTON, YORKSHIRE

W. S. BISAT, M.SC., F.R.S., F.G.S.

IN 1939 Mr. J. A. Dell and the writer discovered a species of moss (*Hypnum*) accompanied by ostracods at the well-known cliff section at Dimlington on the Holderness coast (Bisat, W. S. and J. A. Dell, *Proc. Yorks. Geol. Soc.*, Vol. XXIV, Part IV, 1940, pp.219-222). The moss occurred in thin streaks or laminae on the bedding planes of a silty loam overlying the Basement boulder-clay, and at an horizon 100 feet below the surface, being covered by later boulder-clays of the Drab and Purple Series. Its position is about 160 yards north of the steel tower.

The original exposure was re-examined in 1945, when the *in situ* position of the moss was confirmed and the following details of the succession of silt and moss recorded :—

Silt 8", Moss lamina, Silt 8" Moss lamina, Silt 3", Moss lamina, Silt 6", Moss lamina, Silt 1' 0", Moss lamina, Comminuted Silt 1' 0", Pale Silt 4' 0", Basement boulder clay.

On the same day Mr. G. de Boer found a second exposure of moss about 300 yards north of the original locality, and at the same horizon, in a silt-filled hollow in the upper surface of the Basement clay. This second basin is quite a small one, being only about 30 feet wide at the top, and with a maximum depth of 7 feet, the moss occurring about halfway up. The exposure was extremely clear, occurring in a perfectly clean wave-washed vertical face extending 25 feet upwards from the beach, with the moss bed about 8 feet up. The beach level was at the sole of the cliff.

The Basement clay with its moss-yielding silted up hollow is here seen to be capped by (1) a thin line of erratic pebbles (2) 8 feet of dark drab boulder clay (3) 1-2 feet of chalky gravel and sand, partly current bedded (4) 4 feet of pale drab boulder clay with 'rafts' of red and white material (Trias and chalk) embedded in it, and (5) 1 foot of chalky gravel. These beds are covered by obscurely seen beds of boulder clay, mainly of the Purple Series, to the cliff top.

Later in 1945 the writer found a third exposure of moss laminae in a shallow basin of silt at the same horizon about 500 yards north of Dimlington farm, and 65 yards north of a spring which discharges on to the beach. This basin is about 25 yards long and is at beach level. It has been photographed by Mr. Mason. During 1946 it was covered by slips, but was again partly visible at Easter, 1947.

In 1946 whilst examining foreshore exposures of the Basement clay off Easington Lane I found that several small basins of silt in the surface of the clay also contained moss laminae, though rather poorly developed. One such basin is 15 yards south of Easington Lane, and a second 50 yards south of the first. A third one is at 350 yards north of Easington Lane, a fourth 500 yards north of Easington Lane, and a fifth 50 yards north of the last. These are all a little below half tide. In the summer detection of this moss is rendered difficult by marine growths.

It thus seems abundantly demonstrated that moss occurs in thin laminae in silt basins at the top of the Basement clay at widely distributed points in this area, with a known length of  $2\frac{1}{2}$  miles along the coast, and at levels which vary from half tide mark to about 15 feet above high water.

So far as the writer is aware these are the only records in Yorkshire of plants between beds of boulder clays. The recession of the ice which allowed moss to grow may have been only a local one, but it should be mentioned that the clays of the overlying Drab series are markedly different in appearance and erratic content to the underlying Basement clay, varying in colour and in the more abundant and larger erratics with a higher proportion of chalk and flints.

My thanks are due to Mr. Mason for the photographs illustrating one of the moss exposures.

## OCCURRENCE OF *MACROPLEA APPENDICULATA* Panz. (Col. Chrysomelidae) IN YORKSHIRE.

E. W. AUBROOK, F.R.E.S.

STAINFORTH (*Nat.* 1944, 81-91, 121-139) records the discovery of *Macroplea appendiculata* Panz. as a Yorkshire beetle from adults taken on August 26th, 1943, from cocoons on the roots of *Scirpus lacustris* L., *Sparganium ramosum* Huds. and *Scirpus maritimus* L. growing in Hornsea Mere. Later in the same year he discovered the species in Leven Canal, East Riding, singly on the roots of *Sparganium ramosum* and commonly on *Carex* spp., and again at Hornsea on roots of *Typha angustifolia* L.

Some years ago my friend, the Rev. E. J. Pearce, M.A., F.R.E.S., captured specimens of a *Macroplea* in the River Wharfe between Harewood and Collingham. These specimens were, I believe, sent away for identification, and all trace of them seems to have been lost.

Mr. Pearce very kindly told me approximately where in the Wharfe he had made his captures, and on July 20th, 1947, I visited the river at its nearest point to East Keswick (V.C. 64).

Some considerable time was spent in working the water-net amongst such areas of *Potamogeton* as were accessible from the river bank. The results of this search were completely negative. Finally, recalling Stainforth's collecting experiences with Donaciinae, some of the *Potamogeton* was uprooted and at once numerous white larvae were found feeding on the rhizomes. Cocoons of typical Donaciine shape were also present, attached to the rhizomes. One of the cocoons contained a mature *Macroplea appendiculata*, and larvae could be seen in the others. During the uprooting of the plants, an adult *Macroplea* rose from below to the surface of the water, and later a second was captured whilst walking amongst the leaves.

Larvae and cocoons were present equally on both *Potamogeton suecicus* Richt. (= *P. filiformis* × *pectinatus*) and *P. perfoliatus* L., for which determinations I am indebted to Dr. W. A. Sledge.

Further collecting was carried out on August 14th, when larvae and cocoons were very numerous. A small percentage of the cocoons contained adult beetles. It was noted that there was a gradual change in the colour of the cocoon, from a pale yellow in the case of presumably newly spun ones, to the reddish brown of those containing fully formed beetles. The latter colour is not due to the darkness of the beetle showing through, since it does not change when the occupant is removed.

On October 6th, 1947, the majority of cocoons, found in the same stretch of river, contained beetles. Rather surprisingly, in view of the paucity of free adults on July 20th, feeding larvae were still not uncommon, and examples measuring 5.0 mm., 6.5 mm. and 10.5 mm. were collected, those of the latter measurement being probably in the last instar.

The foodplants *Potamogeton pectinatus* and *perfoliatus* are included by Stainforth in his list of plants on which larvae or cocoons of *M. appendiculata* have been found, elsewhere in the British Isles or on the Continent.

This species appears to be very plentiful in the locality under examination in the River Wharfe, and similar collecting in other Yorkshire rivers would probably yield interesting results and add much to our knowledge of the distribution of this beetle in the county.

The name of the Botanical Society and Exchange Club of the British Isles has been changed to :—

### THE BOTANICAL SOCIETY OF THE BRITISH ISLES.

New and extended facilities are being offered to members, including the privilege of consulting a Panel of Specialists. A Conference on 'The Study of Critical British Groups' is being arranged in London on April 9th and 10th, 1948.

ALL enquiries should be addressed to the Honorary General Secretary :—  
Miss M. S. CAMPBELL, c/o Dept. of Botany, British Museum (Natural History),  
Cromwell Road, London, S.W.7.



## A THIRD BRITISH *SPERGULA*

H. W. PUGSLEY, B.A.

[Botanists at home and abroad will have learnt with regret of Mr. Pugsley's death which occurred shortly after we received the manuscript of this article. An obituary notice and appreciation of his contributions to systematic botany will be found elsewhere in this issue].

On page 96 of the July-September, 1947, issue of this Journal, I briefly reported the discovery of *Spergula pentandra* L. in Britain. On examining my specimens, however, I find that they belong not to the true Linnaean species but to the closely allied *S. vernalis* Willd. (*S. Morisonii* Bor.).

The two species grow in light sandy or acid soil on heaths and cultivated ground, apparently much as do our common *S. arvensis* L. and *S. sativa* Boenn., but they are both plants of spring rather than of summer and rather ephemeral in duration. Neither has been recorded to my knowledge as an alien in Britain.

In the third edition of Ray's *Synopsis Meth. Stirp. Brit.*, p. 351 (1724), by Dillenius, a plant since identified with *S. pentandra* was stated to have been seen in sandy places in Ireland by Dr. G. Sherard, and according to Druce & Vines's *Dillenian Herbaria*, p. 108 (1907), an original specimen still exists. Druce considered the plant, of which he published an account in *Annals of Botany*, iv. 378 (1890), to be true *S. pentandra* L. No later specimen is known, and the species is not mentioned in Praeger's recent *Botanist in Ireland*. *S. pentandra* L. is included in Smith's *Flora Britannica*, ii. 503 (1800), with the remark 'Hanc speciem nondum inveni, sed ex Dillenii fide admisi.' It is inserted in a similar way in some other British floristic works.

A special interest attached to *S. pentandra* from the early account in Morison's *Plantarum Historia Universalis Oxoniensis* (1680). In pt. ii, p. 551, it is described at some length and is also figured. Morison says it is distinguished with difficulty from the common *Spergula*, except for its compressed, black seed with a white, membranous wing surrounding it. He adds that a variety is found, producing a brown seed with a smaller wing, and that he found both forms in cultivated fields around Rupella (Belgium?) and in sandy fields at Chambord (France?). Druce and Vines could find no specimens in the Morisonian Herbarium.

The existence of two forms was not noticed by Linnaeus in the account of *S. pentandra* (*Sp. Pl.* 440 (1753)). The type specimen in his herbarium is without seeds, but clearly shows the long, narrow petals that characterise Morison's typical form. In 1787 Willdenow (*Fl. Berol. Prodr.* 158) described a plant, under the name of *S. vernalis*, which grew in two stations near Berlin and resembled *S. pentandra* except for the number of its stamens (10 instead of 5). In the fourth edition of *Species Plantarum* (1799), however, he omitted this plant and included *S. pentandra* L. only. From this date the two forms remained undistinguished, as is shown by the exsiccata sent out by Fries in his *Herb. Norm.*, iv, 55, which is actually *S. vernalis*.

An adequate account of *S. pentandra* L. and of Morison's variety (as *S. Morisonii* Bor.) was first published by A. Boreau in Duchartre's *Revue Botanique*, ii, 423-4 (1845-46). Here the features of the two plants are satisfactorily contrasted.

Boreau's name is adopted by Rouy (*Fl. Fr.* iii, 298 (1896)), who notes that Willdenow's diagnosis of *S. vernalis* applies equally to *S. Morisonii* and *S. pentandra*. Hegi, who not only describes but illustrates in a text figure both plants (*Illustr. Fl. Mittel-Europa*, Band iii, 418 (1909-12)) also uses Boreau's name. On the other hand *S. vernalis* Willd. is taken up by Willkomm and Lange (*Fl. Hisp.* iii, 161 (1874)), C. A. M. Lindman (*Svensk Fanerogamflora*, 245 (1918)), and Ascherson and Graebner (*Syn. Mitteleur. Fl.*, Band v, i, 821 (1919)). The reason for preferring Willdenow's name is not clear, but as the plant may be represented in his herbarium, which is not at present available, or may still be known in his original stations, there may be sufficient justification for using his name, and it is provisionally retained here.

*S. vernalis* has a more northern and perhaps wider distribution in Europe than *S. pentandra*, and is much better represented in *Herb. Mus. Brit.* As it occurs in Belgium, Holland and South Scandinavia, from which *S. pentandra* is absent, it is the more likely plant to be found in Britain. It is given, rather

curiously, for Great Britain by Rouy (*l.c.*) and by Nyman (*Consp. I.* 122 (1878)), and in Ascherson and Graebner's work 'British Isles' is cited in its general distribution while under *S. pentandra* we read 'Ireland, not confirmed.' The origin of these records of *S. vernalis* for Britain is unknown.

I first met with *S. vernalis* towards the end of April, 1943, when visiting a piece of ground on the heathland between Tunbridge Wells and Crowborough that had been enclosed for the cultivation of Rhododendrons and other Ericaceous shrubs a few years previously. The plant was then in flower but without mature capsules, and it arrested my attention through its dwarf, neat habit of growth and its early flowering. The few specimens that I collected were not incorporated in my herbarium till last winter, when, on examination, I saw that they appeared to belong to *S. pentandra*. Last May I revisited the locality, where the area of cultivation had been extended, and found the Spurrey again, flowering and fruiting in considerable abundance. On making local enquiries respecting its origin in a situation so like some of those in which it is found on the Continent, I was assured that its seeds must have been dormant in the soil, for no shrubs had been imported from abroad prior to 1943. But I have recently learned that this information is inaccurate, as some Rhododendrons and Azaleas which had been obtained from Holland were planted on the plot before 1943. According to Heukel's *Flora van Nederland* ii, 131 (1909), where it is nicely figured, *S. vernalis* is rare in Holland, found only on sandy alluvium. The quantity of Dutch shrubs planted in this spot must be negligible in comparison with the large numbers that have been annually imported by British nurserymen over a long period, and there is no record of the Spurrey ever having been previously observed. It thus seems doubtful whether it was introduced in this way, and seeing that it has maintained itself and increased for at least five years, it will probably prove a permanent addition to the local flora. It may therefore be classed as a denizen upon present information. The habitat seems exactly like some of the stations in France and Germany, as shown on the labels of exsiccatae.

The subjoined description is taken from the British material.

*SPERGULA VERNALIS* Willd. Fl. Berol. Prodr. 158 (1787); *S. Morisonii* Bor. in Duch. Rev. Bot. ii, 423-4 (1845-46); *S. pentandra* auct. non L.

*Exsicc.* Pugsley No. 817, in Hb. Pugsley; No. 818, in Hb. Mus. Brit., Hb. Kew, and Hb. Pugsley.

Annual, 10-20 cm. high, usually erect from a decumbent base and much branched, the inflorescence and foliage with scattered, fine, stalked glands or sometimes glabrous. Leaves linear-subulate, dark green, in dense, shortly stipulate whorls, rarely 10 mm. long, slightly fleshy, without a dorsal furrow, often  $\pm$  deflexed, the whorls scarcely reaching the branches of the inflorescence. Inflorescence generally very floriferous, with flowers borne on long, slender pedicels, which are spreading in fruit. Sepals 5, glabrescent, oval, shortly acuminate, with scarious margins. Petals 5, white, elliptical, subacute, contiguous, subequalling the sepals. Stamens 5 or 10. Styles 5. Capsule 5-valved, slightly exceeding the calyx. Seeds blackish brown, flattened, lenticular, smooth, nearly circular, 1.1-6 mm. broad (including wing), with scarious, finely radio-striate, whitish or brownish wing, less in breadth than the diameter of the disk, which is surrounded by a margin of minute, whitish papillae.

Hab. Sandy, cultivated ground near pine wood, between Tunbridge Wells and Crowborough, v.c. 14.

General Distribution. South Scandinavia, Germany, Holland, Belgium, France, Spain, North Italy, Austria, Hungary, Poland, Czechoslovakia.

The allied species, *S. pentandra* L., may be distinguished by its laxer whorls of longer, less deflexed leaves, its narrower, non-contiguous petals often half as long again as the calyx, and its black, non-papillose seeds, with a broader, whiter wing, in width subequalling the diameter of the disk.

Both plants differ essentially from the later flowering *S. arvensis* L. and *S. sativa* Boenn., which are larger and coarser in growth and often more glandular, with longer, furrowed leaves and subglobose seeds with a narrow or obsolete wing.

In *Journ. Bot.*, LV. 95 sq. (1917), C. E. Salmon printed a paper on ten plants that he thought might occur in Britain. It is a curious coincidence that the discovery of two of these, *Cerastium brachypetalum* Pers. and *Spergula vernalis* Willd. should be published in consecutive numbers of *The Naturalist*.

E. W. MASON, M.A.

Chairman's Address to the Mycological Section of the Yorkshire Naturalists' Union at Masham  
October 11th, 1947.

An unknown number of collections of microfungi have been made by Yorkshire naturalists from all five vice-counties and recorded under the name of *Torula herbarum*. That name has been known to science since the year 1816, and became well known to all contemporary botanists with any interest in microfungi. It is in fact one of the great names in mycology, one of 'les noms immortels de Persoon et de Link' that for the naturalist among the microfungi can never altogether lose their magic. Just because it is one of the key names in the history of the Hyphomycetes, he can never grandly dismiss it altogether from his vocabulary as merely the name of some common mould; for, should he do so, he will also do immense violence to his orderly nomenclature of a host of other Hyphomycetes. Now since 1910, the first point of botanical nomenclature has been to aim at fixity of names: and since 1930, the purpose of giving a name to a taxonomic group has been to supply a means of referring to it. Now again a further point is beginning to be widely appreciated: the importance of aiming at fixity of specimens. The purpose of giving a species name to a specimen, even in a foray list, is to supply a means of referring to it; but it does not supply a means of referring to that specimen itself, as opposed to innumerable other specimens. No specimen can become known to botanical science as an individual specimen, unless it is given some name or symbol of its own to distinguish it from every other specimen; and of all possible symbols its collector's name and his collection number supply the briefest and the best. No one can remain for any appreciable length of time the indisputable world authority upon a taxonomic species; but upon his own name and collection number, and the actual material to which he is applying them as a symbol—on that matter he is the world authority par excellence.

## THE SAME NAME FOR THE SAME THING.

With the adoption of the collector's name and accession number as a constant symbol for the same specimen, the modern botanist can closely approximate to meeting, so far as specimens are concerned, the insistent demand that he should always use the same name for the same thing.

There is also another class of discrete objects that resemble one another so closely that each one of them may be safely treated as if it were exactly the same thing as every other of them. These are the separate unspoilt copies of the same edition of a printed book. They resemble one another immeasurably more closely than do the varying mental states of its author as he wrote it line by line. Accordingly a correct citation of the author, title, page and line of one copy is an exactly correct citation for the same line in every other copy. An author's printed words can accordingly be indexed line by line; what they meant to him however, when he wrote them, can only be discovered from their immediate and general contexts.

For instance it was for this reason, I suppose, that in 1930, the term 'taxonomic' was substituted for the term 'natural' where ever it occurred throughout the International Rules of Botanical Nomenclature; so that from 1930 onwards *Torula herbarum* has ceased to be the name of a natural species, and can be henceforth correctly interpreted only as the name of a taxonomic species.

Now it is perfectly possible to believe that a natural species of plants exists in the field, or if you prefer it in nature, quite independently of the human race; that it was there before the hills in order stood, and may be there long after we are gone. But a taxonomic species cannot exist independently of the human race; for its constituent individuals can neither taxonomise themselves into a species, nor be taxonomised into a species by science in the abstract; they can only be grouped into species by individual taxonomisers.

Now no two spontaneous specimens that have to be taxonomised into species are ever precisely the same thing as one another, or have exactly the same significance in botanical science; for each one that is worth even a casual mention takes its special significance from such considerations as its topographical and ecological occurrence, the nature and quality of its substratum, the month and year of its collection: and, if an old one, from who identified it, and when, and why, and whether it has exerted any influence in the local, national or international literature.

So—there is no help for it—because *Torula herbarum* has become the name of a taxonomic species, it must take the consequences of its new estate ; for no two authors making new observations on new collections or revising old collections will ever be calling exactly the same taxonomic species *Torula herbarum*, but will be talking about two at the least somewhat differing *Torula herbarums*.

#### A HISTORY OF FUNGUSSES GROWING ABOUT HALIFAX (1788-1791)

'A genuine book is that which was written by the person whose name it bears as the author of it : an authentic book is that which relates matters of fact as they really happened.' So Bishop Watson is quoted in Smith's *Synonyms Discriminated* ; and with these definitions especially in mind, I will invite you to look yet once again at the most famous of all books on Yorkshire fungi. But first consider Bolton's exordium, where he goes straight to the point, if ever an author did : 'As this work may possibly fall into the hands of some who are not botanists . . . to these, it will not be unacceptable, to be so far informed of the Generic characters of Plants here treated of, as may enable them at sight of a specimen, to determine at once, to what Genus or Family it belongs.' Not unacceptable indeed, and many a man now living would dearly like to possess a book on all the Yorkshire fungi written by a modern James Bolton of Halifax.

But he is at his best when he takes us behind the scenes, and shows us just where the figures and descriptions of his 231 species originated. ' . . . Often, when I have met with a plant in one state only, whether young, middling or otherwise, I have made an exact drawing in that state ; and finding the plant afterwards in a different state, I have taken another figure, . . . and have always accompanied these figures with descriptive notes. . . . From a selected choice of the above drawings, the figures on the plates were taken ; and from these descriptive notes, the descriptions were selected : and there is not one figure, nor one description in the whole work, which was not originally drawn or written by my own hand . . . '

If we may judge, then from these explicit statements, and if we accept Bishop Watson's definitions, then Bolton's History is as genuine and as authentic a book as a book can possibly be, genuine Bolton on authentic Halifax fungi, more genuine and more authentic by far than any international Synopsis, Systema or Sylloge can possibly be.

In *Modern English Usage*, however, H. W. Fowler gives another possible meaning to the word authentic : e.g. an authentic portrait of Henry VIII might mean not only that Henry VIII was the actual person painted but also that the painting was a speaking likeness of him, at the time he was painted. For this sense of the term authentic, in the absence of any corroborative evidence, one can only assume, as Bolton assumed of other workers in that pictorial age of mycology, that the figures and descriptions are as authentic as the author could possibly make them. These were his words : 'I would be understood at all times to suppose, that the figures given by authors are faithful copies, drawn with proper care from the object present and in a fresh state at the time of drawing :—mine are so.' And this was his rather unexpected conclusion : 'he who collates my figures with the glowing tints bestowed on those of Schaeffer, or with the plump and rich appearance of most of those of Bulliard, may form to himself an idea of great difference obtaining, between the cold barren mountains of Yorkshire and the rich and fertile woods of Bavaria, or the delicious fields of France.'

But the pictorial age of mycology was already drawing to its close, Linnaeus's allowance of twelve genera for all the fungi was being found not generous enough, and in some groups of fungi some mycologists were beginning to preserve specimens from which their descriptive matter could to some extent be corroborated or corrected.

#### SOME CLASSICAL SPECIMENS OF MICROFUNGI

While James Bolton was publishing his *History of Fungusses* (1788-1791) at Huddersfield, H. J. Tode of Pritzler, Germany, was publishing his *Fungi Mecklenburgenses Selecti* (1790-1791) at Luneburg. Like Bolton, Tode described his own fungi in his own words ; but unlike Bolton, he preserved in his own herbarium the specimens that he had described, perhaps because they were mainly small species of *Sphaeria*, and he had found out how to preserve them readily.

As early as 1791, Tode was corresponding about his own fungi and about Bulliard's *Histoire des Champignons* with C. H. Persoon who was then residing in the University town of Gottingen, and beginning to establish a local reputation



among German students of fungi that in ten years time was to become international. In 1792 Tode wrote him a letter that is till preserved at Leyden, a sentence of which was kindly Englished for me there : ' your letter keeps the deepest silence (*altissimum silentium*) about your very interesting paper, which was due for press the 29th of September, and which I was looking for with the longing of a lover. How to explain this? ' Coming events were already casting their shadow before them.

Very few of Tode's specimens are in existence today. While he lived, they served no doubt to refresh his memory and to corroborate or emend his published descriptions of them. After he died, they were thrown into a pond behind his house. But when in turn Persoon's time was coming, he made no mistake with his fungus collection. In 1829 the Government of the Netherlands took it over, and transferred it first to Brussels and then to Leyden, where it is preserved in the Rijksherbarium to this day.

#### EARLY GERMAN AUTHORS, AND THEIR GERMAN SPECIMENS

Even though we restrict ourselves to what may roughly be called moulds or Hyphomycetes, nevertheless the first point of our nomenclature must still be to aim at fixity of names ; and by what has become universal consent the correct way to do this is to trace each name to its origin, and cite its author, together with book, the page and the date of publication. The test that this has been done correctly is that whenever it is checked, the answer is always the same.

Our first point will be to establish who first published the classical generic and species names and where and when, and what has happened to the material that was called by those names by the authors of those names. As mentioned before, the two earliest material authors were Tode and Persoon. Soon after the publication of his *Synopsis* in 1801, Persoon left for Paris where he resided until his death. Twenty-one years later, he yielded to insistent pressure, and between the years 1822-28 published three volumes of a new book *Fungi Europaei* ; but the glory had departed, the work was not finished, and the contents were not indexed until 1942. In France, two of his most constant correspondents were J. B. Mougeot and J. B. H. T. Desmazieres, both of whom submitted specimens to him for identification, and both of whom published long series of fungus exsiccata. Some of Persoon's names can accordingly be authenticated from material at Leyden, and also by material distributed by his two correspondents.

In Germany the work of publishing Hyphomycete names proceeded in earnest between the years 1805 and 1824 : the authors were J. B. von Albertini and L. P. de Schweinitz, H. F. Link, L. P. F. Ditmar, C. G. and T. F. Nees von Esenbeck, C. F. Ph. von Martius, G. Kunze, J. C. Schmidt, and Ch. G. Ehrenberg. But from 1825 on, all these authors maintained an almost complete silence about the Hyphomycetes that they had called into being.

Between the years 1815 and 1819, Kunze and Schmidt published a set of exsiccata their *Deutschland's Schwämme* ; but as for all the rest, specimens authenticated by them are never quoted, and no living author appears to have seen them. The last man who is known to have examined any considerable number of them was Eliás Fries. He was completing his *Systema Mycologicum*, the so-called starting point of Hyphomycete nomenclature ; and found that he, at any rate, could make nothing of the Hyphomycetes from their descriptions, until he had access also to authentic specimens.

Accordingly, in 1829, he went to Berlin and worked in the Herbarium there ; and also received very valuable assistance from his access to the herbarium of his correspondent G. Kunze.

Now if we ask why the originators of Hyphomycete names suddenly became silent about Hyphomycetes the answer is partly that the key men all went on to other things : and with such things as Botanical Gardens to organise and courses of lectures to originate, they came to treat their early work on Hyphomycetes as little more than juvenile indiscretions.

In 1815, for instance, H. F. Link went as Professor of Botany to Berlin, but it was not until his death in 1852 that his herbarium of more than 16,000 phanerogams and 3,000 cryptogams was incorporated into the herbarium there. C. G. Ness became Professor at Bonn in 1818, and Professor at Breslau in 1830 ; his herbarium of Glumaceae (about 11,000 specimens) was bought by Berlin in 1855 ; his all-important fungus herbarium is supposed to be at Strasbourg, but no one seems to know. Even before the name *Hyphomycetes* Martius (1817) had appeared in print,

its author was off on an expedition to Brazil and never said another word about a Hyphomycete. G. Kunze became Professor at Leipzig, and a world authority on ferns; when he died there he had more than 400 ferns growing in the gardens. Ehrenburg became a traveller and a collector of plants in general: but it was not until 1876, when he died, that 40 small fascicles containing the original material of new species described by him was purchased by Berlin. As early as 1812 Schweinitz had left for America and his European specimens have apparently never been heard of since.

The modern fungus floras of Germany have been written without any reference to specimens actually identified by all these early authors; it is just as if "Hamlet" had been written without the prince.

#### THE SAME NAME FOR DIFFERENT THINGS

In 1832, Fries completed the publication of his *Systema Mycologicum*, and in 1836 M. J. Berkeley presented the first systematic account of British fungi in Smith's *English Flora*, v, 2, Fungi. Thirty-five years later M. C. Cooke covered the ground again and brought the species recorded up to date in his *Handbook of British Fungi* (1871). Twenty years later and history was repeating itself. Between the years 1882 and 1889, P. A. Saccardo published the first eight volumes of his exhaustive *Sylloge Fungorum*, and between the years 1892 and 1895 G. Massee published the four volumes of his *British Fungus Flora*.

Now the diagnoses of the Hyphomycetes that Berkeley described as new in 1836 were, of course, Berkeley's descriptions drawn up from British specimens; the diagnoses of the old species, however, were Berkeley's almost word for word English translations of the diagnoses given in Fries' *Systema*; and, generally, these English translations were in turn again carried forward into Cooke's *Handbook* in 1871. Not so, however, in 1893; the diagnoses of the earliest species were again not taken from British specimens, nor on this occasion from Berkeley's English translation of the diagnoses in Fries' *Systema*; they were Massee's English translations of the Latin diagnoses in Saccardo's *Sylloge*.

When we appeal to British specimens that are preserved in the Herbarium R.B.G. Kew, we find a position that may be illustrated from the folders of two species accepted as British since 1836. In the *Helminthosporium velutinum* folder, for instance, British specimens of four different species were included there before 1890, and a British specimen of a fifth species has been added since. But no specimen either British or foreign included in the *H. velutinum* folder to this day corresponds to Saccardo's diagnosis that was translated into the British Fungus Flora in 1893.

Similarly with *Torula antennata* Pers., another 1836 species; no British specimen labelled *T. antennata* in the herbarium corresponded to Saccardo's description that had been translated into the British Fungus Flora.

A great advance in the standard practise for describing specimens of Hyphomycetes had been introduced by Prof. P. A. Saccardo; and that advance was incorporated into the standard British Fungus Flora, but at a price. In many instances the same name was being used again, but on this occasion for a quite different thing.

#### "RECOGNOSCE NOTUM IGNOTUM INSPICE"

This motto, from another tongue, is always borne on the cover of the *Transactions of the British Mycological Society*, and one of the Society's original rules explains why they adopted it: "Rarities to be recorded. 9. Members finding rare specimens, or specimens new to the British Fungus Flora, are requested to immediately report the facts to the Hon. Secretary. . . ."—Rule 9 has been suppressed and for a good enough reason. For every single specimen that is found in the field (every so-called *specimen spontaneum*) is not only rare, it is unique. It cannot possibly have been classified into a species, or called by any Latin name, or still less have been mentioned in any British Fungus Flora, until at least one human being has become aware of its existence.

#### SPONTANEOUS SPECIMENS AND CULTIVATED SPECIMENS

In the modern business of making taxonomic species that work, we must remember the enormous significance of the material studied. The field naturalist, who finds similar spontaneous specimens when he looks for them in similar places

can feel some confidence that he is dealing with individuals that are ordinary enough *corpora sana* to be taxonomised into species. Accordingly he can free his mind for the business of establishing the diagnostic criteria that will distinguish the taxonomic species that has emerged before his eyes, and that will help it to emerge before the eyes of everyone else who seeks to find it. It is for this business of taxonomising spontaneous specimens that the Latin species names are now particularly reserved.

The study of cultivated specimens on the other hand is an entirely different business; for there is no *a priori* reason for assuming that any of them would survive in a world of free competition. In contrast with the spontaneous specimens that provide the taxonomic species of natural history, the cultivated specimens of fields and laboratories are a collection of freaks. Their form need not be established in order, so that they can be taxonomised into species; it is their pedigree which must be established, and which authorises the name on their label. Names applied to them accordingly are not being used taxonomically.

#### MOULDS AND PARASITES

Bolton's eleventh and last genus was *Mucor* L., a name for which he provided as the English equivalents 'mould or mouldiness.' The word 'mould' has been in our language from its Old English beginnings; then, as now, it was applied to the top layer of our soil, and fungi which grow out from the mould on to organic matter left in contact with it supply the type idea of moulds.

To the old field naturalists the true fathers of mycology, a mould was always a bit of a betwixt and between fungus; for one of the first distinctions that they made, as mycologists, was between parasitic fungi and fungi that grew on the ground.

The term parasite (from *παρά* (close to) and *σῆτη* (food)) was not a native word, but was introduced into English from Greek in about the sixteenth century; then it had some oblique social reference to feeding on votive offerings, at a rich man's table, and the like, and so it has still. In botany it was applied to a plant found growing on another plant, and not rooted directly in the ground. This was its universal application throughout botanical literature from Linnaeus to Persoon; the history of the Hyphomycetes is interlocked with it from its inception.

Martius invented the term *Hyphomycetes* in 1817 for plants composed of filaments or fibres, that usually propagate by sporidia or spores, and are parasitic on organic bodies. He recognised three sections as follows:

- (i) *Mucedines* Nees: parasitic on bodies, especially of plants, already sodden in corruption.
  - (ii) *Inomycetes* Mart.: parasitic on plant parts whose context is still firm and not yet obviously dissolved in decay.
  - (iii) *Mucorines* Nees: parasitic both on plants that are decayed or that are still living and on animals.
- Here microfungi growing on plant parts in the mould would be classed as parasites.

This original botanical application of the term parasite to a plant growing on another organism as opposed to a plant growing on the ground, was universal in mycology up till the year 1866; thus in 1860, M. J. Berkeley wrote of the 'multitudes of parasites which grow on dead or living plants.' And as late as 1919, in the introduction to Oudemans' *Enumeratio systematica fungorum*, every fungus is counted as a parasitic fungus if it has been found growing on any living or dead part of another plant that has been identified even if only to its genus.

In 1866, A. de Bary invented the word 'saprophyte' (from *σαπρός* (rotten) and *φυτον* (a plant)), and applied it to fungi that inhabit decaying bodies and feed on dead organic substances as opposed to fungi that feed on living bodies. The word has no status in the King's English, but was immediately borrowed by English botany, as so many other terms have been borrowed directly from German botany. From the point of view of natural history, the result has been disastrous. In the transformation of mycology from a descriptive science to an experimental science, fungus species proved to be parasitic on living plants have been picked out as approved subjects for experimental science; the multitude of fungus species that have been found on dead plants but that have not been proved to be parasitic

on still living parts of their host plant, have been dismissed individually and collectively as some common mould.

Of course, no one knows whether a species which has come to be almost universally ignored is really common or rare; what is certain is that the identification of its individuals is immensely more difficult when their occurrence is common to an unknown number of host plants and is not restricted to a single host plant.

But, as was well known to de Bary, the application of the term parasitic and saprophytic to fungus species as straight antonyms just does not work. Individuals have to be grouped into species, and as each is collected, its collector can note whether it was found growing on a tree or on the ground. But what he cannot know is whether that particular individual ever fed on a living bit of that tree or not. He can only classify his specimens into a species judging in the first place from their form and where they were found; he cannot group his specimens on their supposed potentialities.

The whole background of mycological natural history has, as a matter of fact, been thrown into confusion; the immense multitude of fungi growing on the ground became unknown to experimental science. Finally, in 1917, Dr. S. A. Waksman had to ask the question and answer it himself: 'Is there any fungus flora of the soil?' But it is now believed that the naturalists were right after all; that most of the micro-fungi do pick their substratum, dying or dead, with care, and often with meticulous care; that the term soil is too indeterminate to provide the *locus natalis* that is genuinely characteristic of a species of micro-fungus, and that the method of plating out blindly from the soil, though it tells something, yet does not tell enough.

But to return to the point, *Torula herbarum* is a common mould in that its occurrence is common to numerous host plants; it is also frequent, for of nearly 50 collections preserved at Kew, nearly all are close enough to one another to pass as the same thing, and about the same number of collections have also been seen from other sources. There is no sort of mystery about it. The history of its name is also well established. It was first called *Torula monilis* Pers. in 1795; it was renamed *Monilia herbarum* Pers. in 1801, when Persoon reduced the genus *Torula* to sub-generic rank; it was cited by Link in 1809 sub *Monilia herbarum* Pers. as the only species when he raised the genus *Torula* again to generic rank. In 1816 he actually called it *Torula herbarum*. Finally, it was accepted in Fries' *Systema*, the starting point of nomenclature.

There has been no gross misapplication of the name; in the Persoon Herbarium, there are three specimens labelled by Persoon as *Torula monilis*, and three more labelled by Persoon *Torula herbarum*. I accept all these specimens as authentic for the name *Torula herbarum* (Pers.) Link, because they are authenticated by Persoon himself. Again, in Fries' herbarium at Uppsala, there is another specimen labelled by Fries himself as *Torula herbarum*. I accept this as authentic for the name *T. herbarum* (Pers.) Link ex Fr., again because it is authenticated by Fries himself.

Unfortunately, however, *Torula herbarum* is the name only of a common mould that is unknown to experimental science, and there is going to be trouble.

**Out of Doors with Nomad**, by Norman Ellison. Pp. 208, with numerous woodcuts by C. F. Tunnicliffe, University of London Press Ltd. 7/6.

Nomad the Naturalist has delighted many boys and girls and earned a wide popularity with his natural history talks on the B.B.C. Northern Children's Hour. In this book he portrays the birds and animals, the life and atmosphere of the English countryside, developing his theme against the background of an adventure story. Or should one say that this is an adventure story written against a background of natural history? However one looks at it there is material here to interest any boy or girl with a liking for country life, and if he or she is already interested in natural history the enjoyment will be much increased. C. F. Tunnicliffe's really admirable woodcuts add very greatly to the attractions of this reasonably priced book which we warmly recommend as a gift especially suitable for a young naturalist.



W. G. BRAMLEY

*Puccinia graminis* Pers.

Up to the present year, 1947, I have had very few notices of aecidia of this species in Yorkshire, and the published records appear to be equally scarce. The only recent occurrences I have of wild aecidia are from Malton district collected by Dr. Sledge in June, 1942, and a very meagre gathering at the Robin Hood's Bay meeting in 1946.

In 1947, however, things have been very different. A few bushes of Barberry at Stutton near Tadcaster, have been under observation for some years, and a very few infected leaves were seen in 1945. This spring the lower branches particularly of two of the bushes were very badly infected and later the half-ripe fruit was also attacked. A search revealed that the only grass infected with the teleutospore stage was *Agropyron repens*. During the summer particular attention has been paid to this area but up to late October no *Puccinia graminis* has been found on any grass except *Agropyron repens*. On October 21st, however, a single plant of *Bromus ramosus* had three culms showing the rust. This plant was at least a quarter of a mile away. Less than an hour previously I had collected the rust in some quantity on the same host at Saw Woods, where they abut on the York-Leeds Road. This is the first time I have seen the rust on this host.

Some of the infected Barberry branches were taken from the Stutton locality on June 26th, and placed in water amongst Barley; mixed Wheat, Barley and Oats; *Dactylis*; and *Lolium*. In two cases Barley was infected and it was only after some time that Wheat was found rusted.

Miss J. Sykes showed me specimens and informed me that Barberry was fairly heavily infected with aecidia of *Puccinia graminis* at Tickhill near Doncaster on June 6th, 1947, and that aecidia were also seen at Slingsby on July 5th. No search was made for teleutospores in these localities.

The following is a list of the grass hosts on which I have seen *P. graminis* in Yorkshire during the past dozen years with notes on their frequency.

*Agropyron repens* L. Commonly.

*A. caninum* Beauv. Bolton Percy, 1945, infrequent.

*Agrostis* spp. Frequent.

*Arrhenatherum elatius* (L.) Mert. and Koch. Bolton Percy, 1937, only time seen on this host.

*Avena fatua* L. Frequent.

*A. sativa* L. Oat. Common.

*Dactylis glomerata* L. Bolton Percy, 1937, only time seen on this host. One plant only.

*Hordeum distichum* L. Barley. Frequent.

*Lolium perenne* L. Bolton Percy, 1945. Only time seen on this host.

*Secale cereale* L. Rye. Sutton-on-Forrest, 1934. Only time seen but may be more frequent.

*Triticum vulgare* Host. Wheat. Common.

This rust apparently does not occur every year but the following were noted as particularly severe outbreaks, 1937, 1940 (especially severe) and 1945.

*Uromyces fabae* (Pers.) de Bary.

This species is nearly always to be found on Field or Horse Beans and quite frequently on the Broad Bean. As a rule uredospores are produced in abundance and frequently cause partial defoliation. Teleutospores are much less common and generally occur on the stems and leaf stalks late in the season and apparently after the host is semi-moribund. In some seasons I have been unable to find teleutospores in crops of the Field Bean.

This season (1947), however, teleutospores were produced in some quantity as early as the latter end of August. Some of these collected towards the end of September were placed on newly-planted Field Beans and Maple Peas. Aecidia were produced on the Beans in three weeks but none on the Peas.

Although a quantity of Beans have grown in the field I have been unable to find any aecidia on these.

*Uromyces pisi* Wint.

This species has been noted on *Lathyrus pratensis* for a number of years in several localities in Yorkshire. Uredospores are produced abundantly on both sides of

the leaf and less frequently on the stem. Teleutospores are much less numerous, produced late in the year and may be on the leaves or stem. Sori in both spore forms are small rarely being more than 1 mm.

In September this species was noted on three varieties of Garden Pea, *P. sativum*. The form on this host differs considerably in macroscopic characters. The uredosori are larger, slightly brighter in colour and much less numerous. The greatest difference occurs in the teleutosori. These are considerably larger, 2-3 mm. and much darker in colour, very dark brown, and in my specimens more abundant than the uredosori. Both kinds of sori are also more often on the under surface of the leaf and some on the stems where they are more linear.

Microscopically there is little difference in the respective sizes of the spores. The teleutospores from *P. sativum* shew the punctations much more clearly, which may be due to the age of the *Lathyrus* specimens (1939).

### FIELD NOTES

**A Stoat Incident**—I was sitting on a low bridge with four friends beside one of the open dykes which flow through Arnside Moss one hot day in July, 1944, when our attention was attracted by a pair of Kingfishers which were soon out of sight. We then noticed that there was a large colony of Water Voles resident on both banks and the animals were peacefully feeding near the water line, apparently unaware that they were being watched. A few Coots and Water-hens sailed leisurely amongst the reeds some little distance away.

Then we noticed something swimming in small circles on the top side of the bridge, mainly using the downward flow of the current as means of travel. As it neared the bridge immediately below us we saw that it was an adult Stoat. The animal looked rather dazed and from its feeble efforts we expected it to sink at almost any moment. We noticed, too, that occasionally it swam on its side, hardly moving its legs at all for the narrowness of the bank at this place increased the current and this speeded up the Stoat's progress. Meanwhile, about twenty yards down the dyke-side the Voles continued feeding, quite unconcerned.

Then we noticed that the Stoat began to widen its circles until it was almost touching each bank until suddenly, like a flash, the Stoat simply sprang out of the water and it seemed to catch a feeding Vole with the utmost ease. Both Stoat and Vole partly fell backwards down to the water's edge but the struggle was short. The Vole was killed and the Stoat dragged the body into a hole in the bankside and we saw neither Stoat nor body again.—FRED DEAN.

**Diptera on the Snow.**—During the prolonged spell when deep snow lay on the ground in the early months of 1947, a sudden and considerable rise of temperature was recorded at the Meteorological Station in Ravensknowle Park, Huddersfield. This had an unusual effect on certain Diptera which had selected the clock tower of a shelter in the Park as hibernating quarters.

On February 27th, I observed a number of flies lying dead on the snow to the leeward side of this shelter. Most of them were dead, but one or two were moribund and revived when warmed after being collected.

The maximum temperature during the 24 hours ending at 9-0 p.m. G.M.T. on February 26th was 38.2° F., the highest temperature since January 22nd; the minimum was 26.8° F. During the same period ending 9-0 p.m. on February 27th, the figure was 38.0° F. The temperature at 9-0 a.m. G.M.T. on February 26th was 36.0° F., 15.1° F. higher than at the same time on the previous day; and on February 27th at the same time the figure was 32.4° F.

I subsequently examined the clock tower and found there four living flies. There were, of course, many crevices suitable for hibernating flies into which it was not possible to see, and no doubt a considerable number could have been found by a prolonged search.

The following species were represented amongst the flies picked up from the snow :—

*Dasyphora cyanella* Mg. 7 ♀♀

*Muscina pabulorum* Fall. 3 ♀♀

*Phormia terrae-novae* R.D. 1 ♂

*Pollenia rudis* F. 1 ♀

I am indebted to Mr. H. Oldroyd, B.A., F.R.E.S., for the above determinations.—E. W. AUBROOK.

## In Memoriam

HERBERT WILLIAM PUGSLEY

(1868-1947)

THE death of Mr. H. W. Pugsley at his home at Wimbledon on Tuesday, November 18th, 1947, has deprived British botany of its most distinguished amateur worker. His friends have lost a colleague who was held in the highest respect and on whom they could always rely for sound advice and a unique fund of knowledge. His outstanding success has rendered his place impossible to fill for many years to come.

Pugsley was born at Bristol on January 24th, 1868, and was educated at Bristol Grammar School. He regarded himself as a West Countryman and throughout his life maintained a keen interest in the botany and affairs of the south-west peninsula. In 1889 he took his B.A. degree at London University and entered the Civil Service in 1896. At the time of his retirement in 1928 he was in charge of the Admiralty Savings Bank.

His first botanical publication was a short note on Wimbledon plants in the *Journal of Botany*, 1900. This was followed two years later by an important paper on *British Capreolate Fumitories*, illustrated by his own drawings. The paper opens with a statement of the circumstances which led him to an investigation of the group followed by a summary of previous attempts to deal with it in Britain in relation to continental work. Finally there is a synopsis of the British plants, including a description of his new species, *Fumaria purpurea*. This logical sequence, with appropriate modifications, was used throughout Pugsley's life as the basis of nearly all his papers and gave them a characteristic imprint. His interest in Fumitories was never lost and he wrote on them again in 1912, 1919, 1926, 1927, 1932, 1934, and 1937.

Another important series of papers dealt with *Euphrasia* on which he had publications in 1919, 1922, 1932, 1933, (two), 1936 (two), and 1940, in addition to his fine *Revision* of the British species in 1930. An important feature of his work on this group was the critical re-examination of the work of Wettstein, Townsend and others in which he showed a wealth of original thought. The Eyebrights are a far more difficult group than the Fumitories and their study had not been neglected in this country. In the present writer's opinion Pugsley's work published during his lifetime reached its highest level in elaborating this group and his descriptions, all written on a uniform plan, are of a very high standard. Unfortunately he found the minute characters by which these plants are distinguished very trying to his eyes in recent years. It may be found that later determinations and modifications of his concepts as to the limits of the species may be less good than earlier work.

There can be little doubt that our most difficult critical genus is *Hieracium*. Previous attempts to deal with it have conspicuously failed to relate British material to continental work and the majority of native Hawkweeds have never been satisfactorily named. Pugsley had been interested in the group for many years and published short papers as long ago as 1920 and 1921. Instead of acting as a deterrent the tremendous difficulty of the task of producing order out of chaos acted as a magnet, and he dedicated the last years of his life to his *magnus opus*, a monograph of the British *Hieracia*. The war delayed completion of the task although part of the manuscript was ready for the printer in 1939. In the *Journal of Botany* for 1941 he somewhat reluctantly published diagnoses of some of the new species separately and a list of British species extracted from the work was included as Appendix 2 to the *Check-List of British Vascular Plants* in 1946. Publication of the whole monograph has been undertaken by the Linnean Society and with the exception of the last short section of galley and the index, the proof was corrected by the author before his death. It is hoped that publication will take place shortly and illustrations from Pugsley's own beautiful drawings will be included.

In addition to *Fumaria*, *Euphrasia* and *Hieracium*, Pugsley published important work on many other groups, including the following genera: *Spergularia* (1921), *Brassica* (1936), *Genista* (1922), *Silene* (1940), *Hypericum* (1940),

*Myriophyllum* (1938), *Jasione* (1921), *Gentiana* (1924, 1936), *Limonium* (1924, 1931), *Verbascum* (1934), *Salvia* (1927), *Orobanche* (1926, 1940), *Mentha* (1935), *Calamintha* (1923), *Orchis* (1935, 1936, 1940, 1947), *Neotinea* (1934), *Juncus* (1930, 1931), and *Carex* (1921). His account of the Robertsonian Saxifrages (1936) was of greater importance than some of these though it met with less general acceptance than most of his other papers. He published a Monograph of *Narcissus* subgenus *Ajax* in the *Journal of the Royal Horticultural Society*, 1933, and other papers on the genus in 1915, 1939 and 1941, and these are of value to horticulturalists as well as botanists. Most of his papers appeared in the *Journal of Botany* and the *Journal of the Linnean Society* though he also wrote in recent years for *The Naturalist* and had occasional publications elsewhere. They are supplemented by numerous notes in the *Reports of the Botanical Society and Exchange Club of the British Isles* and the *Watson Botanical Exchange Club*, and by a vast number of determinations on herbarium sheets which collectively make a very substantial contribution to the science of botany.

Pugsley's keen eye was never idle and, as might be expected, he took a lively interest in the plants which grew near his home at Wimbledon, where he occupied the same house for over fifty years. His published account of the flora of Wimbledon and Merton (*Wimbledon Annual*, 1904 and 1910) included records of 652 species of which he had personally collected 532. In later years he discovered about twenty additional species. Holidays with his family were taken at places chosen for the interest of the flora and these and subsequent stays provided material for a few papers of a topographical nature such as Lyme Regis (1911), Carnarvonshire (1923), Pembrokeshire (1924) and Salcombe (1935).

The outbreak of the recent war was a great blow to Pugsley, who realised that at his age the time remaining to carry out the programme of botanical work which he had planned must be limited. With the evacuation of so much plant material and so many books from London he found serious study hindered. Nevertheless, he used such opportunities as were still available to the full and when some of the British Museum (Natural History) specimens became accessible at Tring he was able to continue his studies on *Hieracium*. In September, 1940, he was compelled to leave his home in London owing to bomb damage and for a time he stayed with a son near Sawbridgeworth, Hertfordshire. The product of this enforced evacuation was a paper on *Arable Weeds in East Herts.* (1941). From here he went to stay with another son at Tunbridge Wells and in August, 1943, I spent a holiday in the town and we enjoyed a number of field outings together. On this and two other visits to see Pugsley in Kent I was astonished at the amount of country he had covered in his perambulations. For a man of 75 years his enthusiasm and energy were remarkable and it must have taken great will-power to overcome the failing health and resultant difficulty in walking long distances which he suffered. The paper on *Spergula* printed in this issue of *The Naturalist* and numerous records in his forthcoming work on Hawkweeds are monuments to the way he overcame his difficulties at this time.

He returned to Wimbledon for a short time but in March, 1944, was compelled by illness and war conditions to leave once more—this time for Combe Martin in North Devon. He stayed here until May, 1945, and used his time to explore the parish, and that of Berrynarbor which adjoins, in great detail. As a result he added 79 species to the known flora of the district from his own observations and a further fourteen from a book of localised water-colour drawings. These form the basis of a paper read at the Newton Abbot meeting of the Devonshire Association in June, 1946, and published in Volume LXXVIII of their *Report and Transactions*, pages 193 to 206. A copy was delivered to his house a few days before his death but he was then too ill to see his work in print. He also contributed to *The Natural History of Ilfracombe* (1945) and *Ilfracombe Fauna and Flora*.

But topographical botany was a secondary interest to Pugsley; it was in taxonomy that he excelled. He owed his outstanding success as a taxonomist to a number of qualities but probably the two most important were an infinite capacity for taking pains and an artistic eye. He never hurried over his botanical work and his papers were the product of unlimited patience and deliberation. He took pride in giving a scholarly finish to his writings and no detail was too trivial for thorough investigation. As a result he often discovered important



facts which had been overlooked and when his work was challenged he was generally able to prove that his opponents were wrong. His interest in art was evidenced in the large collection of water-colours with which his house was filled and there can be no doubt that the keen colour sense to which he trained himself in this connection was of the greatest help in his botany. The quick perception of differences in colour and outline enabled him to separate critical taxonomic units for which closer study revealed additional characters. His skill as a draughtsman not only facilitated the production of excellent drawings to illustrate his own papers but also stimulated close attention to detail.

These qualities were supplemented by a keen eye and wide knowledge. Up to 1939 it was Pugsley's practice to spend part of his generous annual leave in trips abroad. Switzerland he knew well but he also visited most of the nearer continental countries and got to know well-known botanists abroad. In 1922 he visited Algeria with E. G. Baker and Cecil Norman. The knowledge acquired in this way he utilised to the full in constant comparison of the plants he saw with their British allies. Pugsley's wide knowledge was also apparent in connection with general Natural History. He retained an interest in entomology throughout his life and was able to apply information about the distribution of beetles, for example, to botanical problems. Neither was he ignorant about the birds and shell-life of our country.

His character was a most unusual combination of qualities. It demanded respect; even his critics respected him. He was obviously distinguished and in a sense very vain. But this vanity took the form of justified pride in his achievements and the inevitable long series of tales about himself with which Pugsley entertained his friends were never objectionable. He never searched for cheap publicity and poured scorn on others who did so by means of 'New County Records' and 'new combinations.' Of both of these he might have made many if he had been so minded. He was fond of comfort and protested vigorously against poor food or uncomfortable accommodation. His kindness to young and unknown botanists was unlimited and the writer and E. C. Wallace in particular received a great deal of help and encouragement over many years. The very firmness of character which was so valuable in his work led to a certain obstinacy which was sometimes to be regretted. It was perhaps because of this that he would never use 'determinavit' labels but instead wrote his undated notes in pencil on herbarium sheets and labels where they were sometimes difficult to read, and it may have been because of this trait that he was somewhat unorthodox in matters of nomenclature.

Pugsley joined the Watson Botanical Exchange Club in 1902-3 when he acted as Distributor. He remained a member and often contributed specimens until the Club came to an end. In 1907 he joined the Botanical Exchange Club and took an active part in its affairs after the death of Dr. Druce. In recent years he has acted as Honorary Auditor and served on the Committee and various Sub-Committees. He was present at the Special General Meeting on October 25th, 1947, when the name was changed to the Botanical Society of the British Isles. He was elected a Fellow of the Linnean Society on May 6th, 1920, and except for a short interval remained a Fellow until his death. Of the Devonshire Association, Pugsley was one of seven Honorary Members. He was a Fellow of the South London Botanical Institute and except for the war years attended their Council meetings regularly.

The funeral took place on Saturday, November 22nd, and was attended by botanists representing most of the societies and institutions in which he was interested. He was buried at Wimbledon Cemetery a short distance from his home. A wide circle of friends and correspondents will wish to join in offering their sympathy to his widow and two surviving sons in their bereavement. Few men have been privileged to serve the cause of British botany so well.

J. E. LOUSLEY.

(Under the terms of his will the main part of his herbarium will be offered to the British Museum (Natural History) and certain subsidiary material to the Royal Botanic Gardens, Kew, and the South London Botanical Institute.—J.E.L.)

## BOOK REVIEWS

**An Introduction to Paleobotany**, by Chester A. Arnold. Pp. 433, with 187 figures. McGraw-Hill Book Co., 27/6.

Seward's *Fossil Plants* and Scott's *Studies in Fossil Botany* have long been the standard text-books on palaeobotany, a position which they have maintained despite the more recent volumes by Walton, and Seward's *Plant Life through the Ages*. The first-named treatise is too overloaded with detail to make it an ideal work to put into the hands of students, while Scott's book deals only with Pteridophytes and Gymnosperms and does not refer to Tertiary floras. Both are now out of date for the last quarter of a century has witnessed many notable contributions to palaeobotanical knowledge by Lang, Halle, Harris, Hamshaw Thomas and many others. Lang's classical papers on Devonian and Silurian Psilophytes especially have yielded information about the earliest vascular land plants which has fundamentally influenced views on phylogeny and morphological homologies. There has thus grown up a need for an up-to-date text-book incorporating recent discoveries and reviewing old and new facts in the light of modern views as to relationships. Professor Arnold's book admirably fulfils these requirements. To cover the whole field of fossil botany within the limits of one volume has necessarily led to a condensation of the rather detailed anatomical descriptions given by Scott and Seward; but for students' purposes the book thereby gains in value and interest rather than the reverse, for the treatment is sufficiently comprehensive whilst at the same time the constant setting of morphological and anatomical facts in relationship to affinities and classification emphasises the significance of the facts described. In addition to the sections devoted to the different groups of plants there are chapters dealing with fossilisation, the geological sequence of plant life (largely based on North American plants), fossil plants in relation to environment and palaeobotanical systematics. American fossil plants have naturally been selected for description and illustration to a considerably greater extent than in previous works of its kind. The book will, however, certainly be of the greatest value to students in this country, and lecturers who are not specialists in fossil botany will find the up-to-date bibliography appended to each chapter very useful. Professor Arnold's book can be recommended as an addition in every way worthy of the McGraw-Hill series of botanical text-books.—W. A. S.

**Common British Grasses and Legumes**, by J. O. Thomas and L. J. Davies. Pp. 120, with 50 illustrations. Longmans, Green & Co., 9/-.

This book is intended as a 'guide to the identification of the various species in the field and has been written to meet the needs of farmers, schools, young farmers' classes and Agricultural Colleges.' It was first published in 1938 and its re-issue, apparently without any alteration in content, may be taken as some indication of its proved usefulness.

Twenty-eight of the commonest species of grass and sixteen leguminous species are described and figured, each species with one page of descriptive matter, including brief notes on distribution and economic value, arranged opposite a page of drawings. The decision as to what to omit from such a selection must always be somewhat arbitrary. If *Brachypodium pinnatum*, *Avena pratensis* and *Agrostis tenuis* be included, why not *Koeleria gracilis*, *Avena pubescens* and *Agrostis stolonifera*? No mention is made of the exclusively calcareous habitat of the first-named species and the statement that *Avena pratensis* is 'most common in Britain on the Cotswolds' is misleading. *Poa pratensis* is said to flower in May and June and *P. trivialis* in July and August, whereas flowering is commonly contemporaneous, and the ligule characters which serve to distinguish these species should be 'truncate' and 'acute' not 'small' and 'long.' The inclusion of *Trifolium subterraneum* amongst the legumes to the exclusion of the much commoner *T. striatum*, *T. arvense* and *T. procumbens* is surprising and the descriptions are not free from inconsistencies, e.g. *Trifolium pratense* keys out under the section 'Plants hairy,' yet in the description we read that 'the stems may or may not possess hairs' and the leaves are 'sometimes' hairy. In general, however, the descriptions are good whilst the illustrations, which include numerous dissections of spikelets and flowers, and other reproductive and vegetative parts as well as habit drawings, are particularly clear and helpful.—W.A.S.

**Insect Natural History**, by A. D. Imms. 'New Naturalist' Series, volume 8, Pp. 317, 40 coloured and 32 monochrome plates. Collins, 16/-.

Dr. A. D. Imms is one of the greatest entomologists of to-day. His *General Textbook of Entomology*, now in its 7th edition, is the best textbook on insects ever written. He is also the author of *Recent Advances in Entomology* which has reached its second edition and is one of the finest examples of scientific précis-work which we know. In Methuen's series of Biological Monographs he has an interesting little book on *Social Behaviour in Insects* (2nd edition, 1938) and his recent *Outlines of Entomology* (2nd edition, 1944) may also be mentioned. Add to these a long series of fine scientific papers and one gets a glimpse of the tremendous achievements of Dr. Imms in the realms of technical entomology. Dr. Imms recently retired from the Readership of Entomology at Cambridge University, the culminating appointment in a distinguished career, but not content to rest on his laurels he has now added yet another gem to his already glittering crown.

In writing *Insect Natural History*, the author has achieved the coveted 'double event' in the sense that not only has he written technical books for the student but he now gives us a masterly example in the 'popular' style. It is rarely that an author is able to move with equal facility from one medium of expression to the other.

The author, photographers and publishers (not forgetting the printers) are to be congratulated on having produced by their combined efforts a very fine book which will go far to answer the oft repeated enquiry for 'a book on insects, not too advanced.'

It must be a considerable problem to know what to put in a book of this kind and although Dr. Imms admits that his treatment is uneven we believe he has made a most judicious choice amongst the endless topics of entomological interest which clamour for inclusion. After a short Introduction the first chapter necessarily deals with Morphology and Life History. This is followed by an admirable chapter on the principles of Taxonomy and Classification which very usefully explains matters untreated in any other volume of the series. Chapter 3 deals with Wings and Flight and is followed by one on the Senses and two chapters on the important subject of Feeding Habits. The fascinating topic of Biological Control is dealt with briefly in Chapter 7 and Galls in Chapter 8. Means of Protection, Reproduction, and Aquatic Insects occupy Chapters 9 to 11 whilst the last two chapters deal with aspects of the Social Life of Insects. A more pleasing and representative array of topics could hardly have been chosen. A useful Documentary Appendix follows and then we are given maps showing the distribution of eight species! The latter are something of an anticlimax and are of very little value. One wonders why they were included. Finally, there is a good Index which also includes references to the plates and text figures thus rendering the illustrations easily traced.

Besides praising good work it is the duty of a reviewer to point out errors, perhaps because his perspicacity in detecting them may be thought to establish him as a competent person to review, or perhaps because it tends to indicate that he has indeed read the book under review. Regarding the text we have very little fault to find and can only express admiration for its competency and commendability. Nor will we criticise Dr. Imms' nomenclature, though surely *Chlœon* and *Pteronus* (for *Pteronidea*) *ribesii* are indefensible. It is with the charming and profuse illustrations that the carping spirit of the reviewer must find fault. But let it be said at once that the illustrations are very lovely indeed and we have never seen Dragonflies (plates 6, 7, and 8) more beautifully depicted, nor the Cardinal Beetle's incomparable scarlet more faithfully portrayed than on plate 19. In fact all the illustrations, whether coloured or plain, are excellent, but let it be whispered, several are wrongly labelled! It is a great pity that the need for this criticism should arise in connection with such attractive pictures but scientific accuracy must take precedence over artistic presentation if the high standards of the series are to be maintained. We commend to the publishers the suggestion that a correction-slip be printed for attaching to all undistributed copies.

The following are the errors in question:

Plate IX, fig. d, is *not* the female of *Lucanus cervus* L. If it is a *Lucanus* at all, it is a small male.

Plate 27, b, is probably *Cionus hortulanus* (Gf.). It is not *C. scrophulariae* (L.).

Plate 27, d, the lower element is not *Necrodes littoralis* (L.) but *Necrophorus humator* (Gze.).

Plate 36, c, the plant is not Goosefoot (*Chenopodium*) but Goosegrass (*Galium aparine* L.).

A few printer's slips are noted such as the omission of the final 's' in *solstitialis* on page 79 and in *bombylans* on page 159. On Plate II, a and b, and V a and b, *euparal* is intended for *cuparal*. On page 88, third paragraph, read 'resting' for 'nesting.'

The appeal of this book—on a subject perennial in interest and full of the bustling, busy doings of little animals who 'lay hold on life with an authority and fecundity which nothing equals here below'—derives much from the authoritative and mature experience of its masterly author for whom we now confidently predict another entomological 'best-seller.'—W. D. H.

**Birds on the Wing**, by John Barlee. Pp. 128, including 90 illustrations. Collins, 12/6.

Photographers of birds, past and present, are legion. Most of them, myself included, have photographed birds in flight; but the author is, we believe, the first to specialise in photography of bird-flight. His instrument is a Contax II with a 13.5 cm. lens, which he claims is better than a  $\frac{1}{4}$ -plate reflex for reasons of cost of material, lightness, ease of quick handling, and of focussing by use of the coupled range-finder in which 'the image moves in the same direction as the bird and stopping down does not affect the brightness.' (This last advantage also applied to the old twin-lens reflex). Mr. Barlee frankly admits that 35 mm. film is too small for really sharp and detailed work (*i.e.* for enlargement to big sizes); and to the pleasure given by plates 'after having to fiddle about with miniature film.' For all but flight photography Barlee uses 'a large plate camera.' The pioneers never allowed considerations of weight to hinder possible improvement in the result. As J. A. Speed demonstrated many years ago, the only really necessary piece of apparatus for flight photography is a shutter fast enough to overcome rapid movement, and enough light for its use. With such a shutter, a large plate camera on a stand, focussed on a plane through which a bird is likely to pass, can and has produced results as good as anything in this book.

Many of the author's illustrations of flying Kittiwakes, Herring Gulls, Great Black-backed Gulls, Fulmars, Puffins, Guillemots, Cormorant, Gannet, Curlew, Raven, Chough, Heron, Swift, Swallow, Swans, Geese and others, are lovely enough to defy comparison with anything. Generally there is fleecy sky or water in the background to lend pictorial value, additional to that of the attitudinal records. The letterpress deals with the author's experiences on Irish islands and bogs, and with problems connected with the flight of the species depicted. Numerous interesting incidents are described and readability is maintained throughout. Photographers and bird students will find much to ponder in this book and bird lovers everywhere will be glad to have it on their shelves. On the book's jacket is a portrait of John Barlee in very engaging mood; I shall keep the jacket on!—R.C.

**Geology of the Lizard and Meneage**, by the late Sir John Flett. Pp. 208. 11 Pl. 7/6. **Geology of the Country around Witney**, by L. Richardson, W. J. Arkell and H. G. Dines. Pp. 180. 8 Pl. 5/-. Mem. Geol. Survey, H.M. Stationery Office.

These two latest publications of the Geological Survey are very different in their interest and content. The report on the classic area of the Lizard was the last work of the late Sir John Flett and is an excellent example of the combination of field and microscopic work in the study of a difficult series of igneous and metamorphic rocks.

Round Witney, the rocks are relatively undisturbed and all belong to the Mesozoic Era. They show rapid variation, both vertically and horizontally and so the interest lies mainly in their fossil content. Mr. Richardson describes the Lower and Middle Jurassic, Dr. Arkell the Upper Jurassic and Cretaceous while Mr. Dines discusses the results of his resurvey of the Drift deposits.

The production of these memoirs is in keeping with the high standard of the Geological Survey.



**Transactions of the British Bryological Society, Vol. I, Pt. I.** Edited by F. A. Sowter. Pp. 64. Cambridge University Press, 12/6.

The *Reports of the British Bryological Society* and the earlier *Reports of the Moss Exchange Club* have for the past fifty years met the needs of students of the systematics of British mosses and liverworts. These were almost confined to detailed enumerations and comments on the plants contributed to the annual distribution, together with obituary notices. The Society has now decided to extend the scope of its publication and to issue annual *Transactions* to contain, in addition to the previous matter, original papers and notes on British bryophytes (and to a limited extent on non-British species), an annual bibliography of bryological literature and reports of the official proceedings of the Society. The first part contains articles by Miss G. Wigglesworth, Dr. Paul Richards, Dr. E. W. Jones and E. F. Warburg, together with shorter bryological notes, new vice-county records, reviews, obituaries and other matters of interest. The Society and editor are to be congratulated upon this greatly improved publication. We wish the T.B.B.S. a very successful future.

**One Hundred Years in Yosemite, by Carl P. Russell.** Pp. 226, with 14 plates and one map. University of California Press and Cambridge University Press, 21/-.

This is a new version of an account originally written and issued under the same title in 1931 by the former Yosemite Park Naturalist and present Chief Naturalist to the United States National Park Service. It is an account written not as a guide book but as a very readable and documented story of the discovery and history of development of one of the world's most famous nature and scenic reserves. It describes how the first adventurers reached the spectacular gorges and canyons followed, soon after the discovery of gold in the Sierras, by the invasion of prospectors and traders and the gradual penetration and exploration, often in the face of great hardships and dangers from hostile Indians, of the fastnesses of the Merced and Tuolumne rivers and the mighty peaks surrounding them. The growth and gradual improvement of amenities is traced from the first primitive hostleries to the present-day hotels and camping centres; from the first trails to the existing well-devised system of roads and communications; and tells of the men whose enterprise and vision have been responsible for the development and protection from exploitation of this great park. The natural history of the area is only briefly referred to but the policy and technique which have been adopted towards problems of conservation, protection and administration gain an added interest in view of the recent proposals for the setting up of National Parks in this country. The book is beautifully printed and illustrated and concludes with a detailed chronology, bibliography and index.—W. A. S.

**The Story of My Heart, by Richard Jefferies, edited by S. J. Looker.** Pp. 182, with eight photographic illustrations. Constable & Co., Ltd., 10/6.

I imagine that there are many readers of *The Naturalist* to whom Richard Jefferies' *The Story of My Heart* will make little if any appeal. They will complain of its nebulosity, its use of terms to which it seems impossible to attach a definite meaning, its sheer sentimentality, that is, the overloading of a sentiment with mere emotion. Yet here is a book which has stimulated many minds to a love of the common things of the fields and hedgerows and to a finer appreciation of the deep, mysterious beauty of Nature. It suggests an examination of the ways in which we may approach the things of heaven and earth, the stark elements of creation. There is the purely scientific approach; the gathering of facts, their setting in relationship, followed by the essential confirmation by like-minded workers; there is the artistic approach by the way of form and colour, and the grouping of beautiful elements according to pre-conceived ideas of artistic significance, and there is the mystic approach in which the natural object is regarded as a medium for the expression of spiritual power and as an emanation of specific qualities which can only be perceived by the sensitive soul whose essential life is beyond that of the mere scientific or artistic experience.

In *The Story of My Heart* Jefferies moves on the mystic way. Part of the appeal of the book lies in passages of rare literary beauty; there are delicate cameos of nature descriptive writing; but he is primarily concerned with the deep questions of God, immortality, and the existence of mind. The psychological

handling of these subjects is not convincing, and it would not be difficult to discover incoherencies of idea, but the book is stimulating to thought and most suggestive as a challenge to the mere scientific or artistic handling of Nature. It only remains to say that the book is well edited—and with the original draft of *The Story*—by the competent Samuel J. Looker, whose work in keeping Jefferies in the mind of the present generation, commands our praise and admiration.—W.L.S.

**City of the Bees**, by Frank S. Stuart. Pp. 183. George Allen & Unwin, Ltd., 10/6 net.

In his foreword the author characterises his book as an 'imaginative phantasy' and the casual reader might be excused for accepting it at that value; but it would be a mistake to do so. Indeed the author on second thoughts seems to realise that his first characterisation is a hasty one and only part of the truth, for he is at pains to explain that most of the recorded incidents have their counterpart in real life, and affirms that 'High romance always deals with real life.' To this we beg leave to demur; it is too generalised, as is the title itself, for the Bees referred to are Honey Bees to which *only* the story can relate. That Honey Bees are found in a wild state in this country may be news to many, but not to field naturalists. The writer has seen two such communities in Yorkshire, one in a hollow statue and the other, a very populous one, had taken possession of the roof of a disused cottage in a wood. The rest of the incidents which the author selects for special justification may be accepted without question. As he has written a book on *Bee-keeping Practice* we see that he is a practical romantic and a careful examination of the *City of the Bees* fully confirms this. Doubtless he would agree that while all the incidents here recorded have at different times been the experience of different colonies, it is highly improbable that all have occurred in any one colony. This justifies him, perhaps, in styling his book a romance. Having said this we gladly admit that the story is told in a style so fascinating that we are lured on from page to page until the end is reached, regretting that it *is* the end. We feel that we have been under a magic spell and sigh when released from it. In this particular instance high romance does deal with real life, and the reader unconsciously imbibes much of the wonderful life-history of the Honey Bee told by one who has studied deeply this highly-organised association.

We have pleasure in recommending this book, and are confident that it will give instruction and enjoyment to many more than 'Deirdre' to whom it is dedicated. It is one of the few which demand to be read again and again.—E.G.B.

**General Biology**, by P. D. Strausbaugh and B. R. Weimer. Pp. 718 with 350 figures and 28 plates. Chapman and Hall, Ltd., 28/6.

This is a second edition—extensively revised and partly rewritten—of an American textbook first published nine years ago. It is intended to cover a one-year course. For students in this country it has the disadvantage of lacking detailed treatment of the structure of plant and animal types usually studied in first year courses in botany and zoology. The range of topics included is comprehensive but the treatment is somewhat uneven. Heredity and eugenics receive rather more space than the combined accounts of the morphology and anatomy of higher plants and the mechanism of photosynthesis and respiration. A chapter is devoted to hormones and chemical co-ordination but there is apparently no reference to the ascent of sap and the problems this involves, and translocation in the plant is dismissed in two or three sentences. Since accounts of all groups of animals and plants are included the treatment accorded to each is necessarily brief. Thus the life histories of liver fluke and rust fungus are described without structural details and with no reference in the latter to the spermatogonia and their functions, though these are illustrated in the accompanying figure. The account of the blood groups includes the statement that 'other factors such as the Rh factor, Hr factor, M factor and N factor are known to exist' without any explanation of what these symbols refer to. The presentation is free from the stodginess of many elementary textbooks and the profuse illustrations are a notable feature of the book. (The legends to the figures on page 635 are transposed). Although it can hardly satisfy the examination requirements of introductory students or Higher School Certificate candidates, this book should form useful complementary reading and its emphasis on economic and social implications make it particularly suitable for biology students in adult education classes.—W.A.S.

## THE YORKSHIRE NATURALISTS' UNION EIGHTY-SIXTH ANNUAL REPORT

(Presented at Huddersfield on Saturday, December 6th, 1947)

**The Eighty-fifth Annual Meeting** was held in the Doncaster Technical College by the kind invitation of the Doncaster Scientific Society on Saturday, December 7th, 1946. The Annual Report for 1946 was presented there and is printed in *The Naturalist*, 1947, pp. 17-41.

**The Presidential Address**, entitled 'The Agarics: A Critical Survey,' was given by A. A. Pearson, F.L.S. This is printed in *The Naturalist*, 1947 pp. 1-8.

**The Presidency** for 1948 has been offered to and accepted by Wilfrid Backhouse Alexander, M.A., of the Edward Grey Institute, Oxford.

**The Excursions** for 1948 will be held at :

- V.C. 61. Filey, July 3rd.
- V.C. 62. Thirsk, for Gormire and Pilmoor, May 15th-17th.
- V.C. 63. Balne pond, June 19th.
- V.C. 64. Malham, June 5th.
- V.C. 65. Garsdale Head, July 17th.

**The Union's Activities** were, on the whole, helped by fine weather, though the heavy snowfalls of February and March made travel conditions difficult for the early meeting of the Vertebrate Section, and the entomologists were unfortunate in finding a wet time for their Spurn week. The task of recording bird migration at Spurn has been very thoroughly planned and carried out and will be a valuable help to the national effort; it has certainly been of great assistance also in increasing our membership. The mycologists, too, have been helpful in this matter, due, no doubt, to the successful organisation of the spring and autumn meetings. The 1947 Excursions were well attended, and the thanks of the Union go to the Divisional Secretaries who gave such ready and valuable help.

**The Naturalist.** After fifteen years' service as co-editor of *The Naturalist*, Mr. W. R. Grist has resigned from this position. Expressions of appreciation for his services were voiced at the Annual Meeting of the Union.

Dr. W. A. Sledge will now have the sole charge of the magazine.

In order to maintain the present size of *The Naturalist* and at the same time obviate the need for increasing the annual subscription, it was decided to open a Publication Fund to which all who feel able to contribute are invited to subscribe.

The following changes have been made to the List of Members, 1947 :

### New Members :

- Mr. S. G. Appleyard, 29 Berkeley Mount, Leeds 8.
- Miss S. M. Barras-Smith, 6 Talbot Crescent, Leeds 8.
- Mr. M. A. Barras-Smith, 6 Talbot Crescent, Leeds 8.
- Mr. A. Bassand, Guise Rock, Cowpasture Road, Ilkeley.
- Mr. A. D. Bateman, Lyndhurst, Sutton-in-Craven, Keighley.
- Lt.-Col. R. S. P. Bates, M.B.O.U., Wheatley Old Hall, Ben Rhydding.
- Mr. Clifford Brown, Barmoor House, Scalby, Scarborough.
- Miss F. M. Brown, B.Sc., W.R. Rivers Board, 71 Northgate, Wakefield.
- Mrs. V. A. Cooper, The Gables, Barlane, Stapley, Wakefield.
- Mr. R. F. Dickens, Woodhouse Grove School, Apperley Bridge, Yorks.
- Dr. G. R. Dodds, Masham, Ripon.
- Mr. E. J. Douglas, B.Sc., Rallinbrow, Giggleswick.
- Capt. J. Eastwood, F.R.G.S., Windy Bank Terrace, Meltham, Huddersfield.
- Mr. J. H. Elliott, B.Sc., Ph.D., 23 Sandringham Gardens, Moortown, Leeds.
- Mr. J. Fisher, M.A., Old Rectory, Ashton, Northampton.
- Mrs. H. Foster, Sleightholme Dale, Kirbymoorside, Yorks.
- Mr. A. W. Goodwin, 15 Rossett Drive, Harrogate.
- Mr. C. E. Goodwin, Carmel, Alandale Drive, Garforth.
- Mr. L. F. Gates, 115 Ingram Road, Thornton Heath, Surrey.
- Miss M. Higgs, 18 Raynville Road, Leeds 12.
- Miss M. D. Hyde, 154 Spring Bank, Hull.

Miss E. J. Harling, 205 Hornby Road, Blackpool.  
 Mr. A. Illingworth, Bilton Court, Harrogate.  
 Mr. S. M. Jackson, 15 Westbourne Road, Selby.  
 Mr. L. Jones, 76 Gillshill Road, Hull.  
 Miss R. Killey, Clifford, Boston Spa, Yorks.  
 Mr. and Mrs. M. L. Leefe, 21 West Park Avenue, Newby, Scarborough.  
 Mr. E. W. Lomas, Somerset Hill, Holmbury, St. Mary, nr. Dorking, Surrey.  
 Miss C. R. Marshall, B.Sc., Training College, Bingley.  
 Mr. L. F. H. Merton, B.A., Botany Dept., The University, Leeds.  
 Mr. H. L. Morgan, 61 Hill Top Road, Leeds 12.  
 Mr. R. M. C. Potter, 53 Ferriby Road, Hessle.  
 Mrs. M. Prosser, 11 Ripon Road, Harrogate.  
 Mrs. E. Robinson, Botany Dept., The University, Leeds.  
 Mrs. A. M. Roddis, Bryn Mawr, Brow Road, Haworth.  
 Mr. H. M. Russell, 41 Blackman Lane, Woodhouse Lane, Leeds 7.  
 Mr. M. M. Sayer, 10 The Gardens, Heaton Road, Halifax.  
 Mr. K. Scorer, Bankfield Grove, Nab Wood, Shipley.  
 Mr. R. Slater, Brockenhurst, Loftus, N. Yorks.  
 Mr. W. H. Spreadbury, 35 Acacia Grove, New Malden, Surrey.  
 Mr. Donald Walker, 32 Hyde Road, Morecambe.  
 Mr. R. A. Wormald, Old Vicarage, Foston, York.  
 Mrs. H. M. Worsley, Sharow Vicarage, Ripon.  
 Mrs. P. Yeoman, High Dunnas, Brompton, Northallerton.  
 Keighley Nat. History and Literary Soc., Miss B. T. Rice, 9 Upper Calton Street, Knowle Park, Keighley.

### Resignations :

Mr. Victor Allan, of Harrogate.	Miss J. East, of Bingley.
Dr. and Mrs. Carrick, of Leeds.	Miss E. G. Henstock, of Ripon.
Mr. J. H. Carver, Welton, Brough.	Leeds Grammar School Society.

### Deaths :

Mr. E. B. Gibson, L.D.S., Hebden Bridge.	Mr. F. Lawton, of Huddersfield.
Mr. E. G. Highfield, of Pickering.	Dr. J. M. Taylor, of Thorne.
Mr. J. A. Horne, of Shipley.	Mr. E. Wilson, of Harrogate. (Died on Service.)

### Changes of Address :

Miss J. E. Bartle, to Withybush, Manley Road, Ben Rhydding.  
 Mr. A. G. Beaumont, to Avalon, Wish Hill, Upper Willingdon, Eastbourne.  
 Rev. J. E. Beckerlegge, to Trevilly Bay View Terrace, Newlyn, Penzance.  
 Capt. Cheavin, to 19 Rosendale Road, West Dulwich, London, S.E.21.  
 Mr. B. A. Cooper, to 27 Spilsby Road, Boston, Lincs.  
 Lt.-Gen. Cristison, to Gogar Bank House, Edinburgh 12.  
 Mr. F. H. Edmondson, to Sutton Lodge, Western Road, Rayleigh, Essex.  
 Mr. and Mrs. Flint, to 7 Norfolk Mount, Leeds 7.  
 Mrs. Hazelhurst, to 22 Chapel Lane, Allerton, Bradford.  
 Mr. and Mrs. W. D. Hincks, to 19 Whitefield, Heaton Norris, Stockport.  
 Rev. T. B. Kitchen, to The Vicarage, Howden.  
 Dr. A. A. Lisney, to 66 Monmouth Road, Dorchester.  
 Mr. J. Lord, M.Sc., to 68 Wetherby Road, Acomb, York.  
 Miss C. M. McQuillin, to 37 Coupe Road, Burngreave, Sheffield 3.  
 Capt. W. S. Medlicott, to Whingarth, Shedfield, Southampton.  
 Miss E. Smithson, to 62 Crown Street, Harrow-on-the-Hill.  
 Dr. D. H. Valentine, to Botany Dept., The University, Durham.  
 Prof. L. R. Wager, to 24 North Bailey, Durham.  
 Mr. A. B. Walker, to Mariville, Ruswarp Fields, Whitby.  
 Mr. A. Wilson, F.L.S., to Pear Tree Cottage, Priest Hutton, Carnforth.

### Change of Secretary :

Doncaster Scientific Society, Mr B. Burrell, F.R.A.S., 93 Woodhouse Road, Doncaster.



## BOTANY

(Chris. A. Cheetham).—The many botanical records for the past year that have come to hand all repeat the story of the weather and then state the results that have appealed to the recorders. January was normal after a very wet autumn followed by some frosty intervals, but February brought the longest period of snow any one could remember. It lasted into mid-March. Later on, August, September and October gave us one of the sunniest summers and autumns on record.

The deep snow held back all the early spring flowers, and Mr. Wattam says : 'In mid-March, as the huge snowdrifts thawed, the woodland floors revealed a 3 in. etiolated growth of uprising foliage of the Wild Hyacinth, whilst in pastures aerial growth of Earthnut 6 in. in height looked out of place amid dead sodden grass. March was the coldest and wettest month since 1878, with a rainfall of 8.85 in.'

Most observers note the damage done to evergreen shrubs and trees ; this was not due to exceptionally keen frost, but to an ice coating which formed on the night of March 13th. At Austwick buildings facing south-east were covered with a thick deposit of ice, stonework and windows alike. This ice coated the south-east side of all exposed evergreens ; the leaves and branchlets appeared like glassware and it soon became evident that this exposed portion of the plants was dead. Since then this ice-killed portion of exposed evergreens has been seen from Sedbergh to Spurn, and from Darlington to Worksop. In odd cases new foliage has been developed but usually the dead portion is still evident. Mr. A. Malins Smith says : 'On June 27th I saw that the Conifer plantations above the Valley of Desolation were largely brown trees instead of green and this effect was seen in a plantation above Drebley. I examined them carefully, and though the bulk of the leaves were dead, yet most trees had an occasional shoot with green living leaves.' Mr. Cutmore, the forester at Bolton Abbey, says the browning of Scots Pine on the Burnsall roadside was caused by frost. It is very exposed there. Mr. Smith thinks it will be surprising to some that the Scots Pine, which is held to have such great frost-resisting powers and is considered by foresters to be the best Conifer for planting in Great Britain from this point of view, should have been so much damaged by the conditions of last winter, even in an exposed position.

The effects of the unusual weather are noted by the late dates given for the flowering of normally early plants. The Purple Saxifrage on Pen-y-ghent did not bloom until April 18th, but Miss Rob at Thirsk and Miss Crackles at Hull saw Winter Aconite and Hazel flowers on January 14th before the snow arrived. The earliest snowfall was much lighter on our north-western boundary, and at Austwick on March 4th Coltsfoot and Celandine were in flower. Mr. Smith gives some interesting comparisons between 1946 and 1947. 'Coltsfoot, April 6th, was 7 weeks later than in 1946. Butterbur and Celandine, April 11th, 18 days late ; Bluebell, April 16th, 15 days late ; Blackthorn, May 9th, 31 days late ; Stitchwort, May 22nd, 32 days late ; Hawthorn, May 25th, 15 days late. Later on, however, Wild Rose, June 21st, was 9 days earlier than in 1946 ; Broad-leaved Bellflower, 8 days early : Sycamore took a lead in leafing, May 7th, 27 days later than in 1946 ; Oak, May 8th, 18 days late ; Ash, May 13th.'

Miss Crackles gives Snowdrops March 11th, Crocus March 13th, Celandine March 17th, and Coltsfoot April 5th. Amongst the early flowers, the Mealy Primrose at Austwick was in flower the first week in May and the Bog Andromeda made a fine display in the second week, and we had May blossom on the Hawthorn. At Arncliffe the Mountain Avens (*Dryas*) was over by June 11th. Next we got flowers much too early such as Harebells, June 11th, and some of the St. John's Worts. The Oak May 12th, and the Ash, May 19th, at Austwick still kept the Oak ahead. Mr. Wattam gives May 7th and May 26th. Mr. Smith May 8th and May 13th.

There is general agreement that the flowering period of most plants was short but showy, and Mr. Smith reports the same for garden flowers, saying : 'General opinion is that early flowering in gardens was particularly abundant.' He refers to the case of an untended garden where Daffodil flowers have been counted for 15 years, and this year the number was 50 per cent. higher than the previous best and double that of average years.

Putting the various reports together, one finds agreement that Ash, Rowan, Apple, Pear and Rose are full of fruit, with Elm, Hawthorn and Horse Chestnut next

and Beech, Sycamore, Hazel and Oak poor; the latter may be under-estimated at present and Misses Rob and Crackles put it in a higher class. There are also many indications that a good deal of variation has been noted amongst Hawthorns, Crab Apples, Elders and Alders; some trees fruited well, others were quite bare.

Amongst interesting notes given by our recorders, Mr. Wattam, in his report on the Ash, says: 'This was the first blossoming of the seedling Goathland tree in my garden; it was raised from seed produced in 1930, but although blossoms were plentiful no fruit was produced.' He also says: 'The Cloudberry has been a failure; after a tramp over the Chew Valley area in late August I came to the conclusion that late ground frosts were the cause. Flower spikes in plenty with plenty of immature drupes evidenced a good display of bloom and fertilisation until the apparent frost nip.' This agrees with the absence of fruit on Pen-y-ghent, but here the growth of the plant was deficient and this may be related to the absence noted last year, which seemed to be due to the drought in the early spring.

Mr. Nicholson finds that in Lower Teesdale and Swaledale, Haws are abundant and Sycamore keys are fairly plentiful, but Sloes and Hazelnuts are scarce. The only fairly good report for the latter comes from Upper Wharfedale by Mr. Norman Frankland, who finds them fairly plentiful.

Mr. G. H. Ainsworth told Miss Crackles that *Daphne* and *Forsythia* were in leaf before flowering near Hull, but there is no other note of this occurrence. She draws attention to the damage done by caterpillars of the Cabbage White Butterfly and this has been very widespread and resulted in a serious loss of valuable food plants. Other insect pests damaged foliage in the Hull district such as Apple, Lime and White Beam. At Austwick the Hazels on Oxenber were eaten bare in June and this may have spoilt the fruit. A second leafing made the plants appear almost normal, but these insect attacks may be the reason for the variation of opinions in the matter of secondary growth. Mr. Cutmore told Mr. Smith that the Larch in Laund Pasture, Barden Fell and Drebley Pasture has been badly attacked by the larch shoot moth miner, and an expert has given his opinion that there was probably another pest also. This large-scale devastation in the Larch plantations should interest members of the Entomological Section.

From the Scarborough area Mr. E. R. Cross sends some interesting notes.

'*Gagea lutea* was a mass of flowers, the wood side being carpeted with blooms.

'*Cornus suecica*, which we had great difficulty in finding last year, bloomed well and seems to be extending in the Hole of Horcum, but has difficulty in holding its own on Cross Cliff. *Maianthemum bifolium* greatly improved with the weeding last year and almost every plant bloomed. *Andromeda polifolia* still holds its own on the moors but is most difficult to find; it has stood some years of army tanks and bombs. *Ophrys apifera*, abundant last year, could not be found, and *Listera cordata*, which used to occur in many places on our moors, I am now unable to find. It may be there but none of our botanists have found it recently. *Orobancha elatior* came in profusion and near it one specimen of *O. minor* was discovered. Many fields in this district have been covered with Musk Thistle, in some cases so many as to prevent walking in comfort.'

The hay and harvest periods were good, but crops were light. Mr. W. G. Bramley writes from Bolton Percy: 'Grain crops have done well taking into consideration the season. A fair amount of wheat perished and had to be resown with barley or some other crop. Yields vary, but will be below average for all crops. After a good amount of grass to about August, the drought has now (September 16th) parched it up and the recent rain has not been enough and is too late to do a lot of good. Roots also want rain and still have time to swell. Mangel fly did considerable damage in some fields and seems to be more frequent than formerly. We have finished harvest without even getting wet and nearly finished thatching.'

In *The Naturalist* a note by Miss Rob on Pilmoor gives an insight into the changes that have occurred in that botanically famous area. The post-war period has left many such changes and it will be a useful task to compare the old and present floras of districts that have undergone such alterations.

For this report thanks are due to Messrs. A. Malins Smith and the Bradford Naturalist, W. E. L. Wattam for Huddersfield, J. B. Nicholson for Lower Teesdale, E. R. Cross for Scarborough, W. G. Bramley for York district, Miss Rob for Thirsk, and Miss Crackles for Hull.

**Records Committee** (W. A. Sledge) : The Committee and Union have suffered a heavy loss through the death of Dr. J. M. Taylor and Mr. J. Horne. In recent years Dr. Taylor has worked energetically at the flora of the Thorne area and our recent reports bear ample evidence of the success of his investigations. He had the advantage of residing in an area which has previously lacked a resident botanist and the thoroughness with which he searched the district added much to our knowledge of plant distribution in this outlying part of the county. He also succeeded in refinding some of the rare plants of Thorne Moor known to the botanists of last century but familiar to this generation only as printed records of dubious present-day validity. In Mr. Horne we have lost a young botanist of great promise who would surely have made many useful contributions to Yorkshire botany in years to come.

Only a few weeks before his death Dr. Taylor, with Dr. S. P. Rowlands, found a colony of *Fritillaria meleagris* in a rough pasture near Hatfield. It has been known locally in this station for at least 40 years. The locality is situated some distance from the village and is not parkland or ground where there is any reason to suspect introduction. As in other wild populations of this species, several albinos were present.

Messrs. Dandy and Taylor have recently published (*Trans. and Proc. Bot. Soc. Edin.*, 34, 3, 1946 (1947)) an account of the discovery and distribution of *Potamogeton suecicus* in Yorkshire. They have found this hybrid (previously unknown south of Berwick) in many stations in Wharfedale from Leathley down to Ossendyke three or four miles above the junction of the Wharfe and Ouse, and in Yoredale from Masham down to Langthorpe, two or three miles above the confluence of the Ure and Swale. All the plants previously passed by as *P. pectinatus* in these rivers are of hybrid origin, though no *P. suecicus* has been found in any of the other Yorkshire rivers investigated. *P. pectinatus* moreover appears to be quite absent save in single localities in the lower reaches of the Wharfe and Ure. The explanation advanced for the anomalous occurrence of a hybrid in the absence of both parents and at so great a distance (about 120 miles) from the nearest known locality of *P. filiformis* is that these colonies of *P. suecicus* represent survivors of hybrids which were either produced here in interglacial times or which came to Yorkshire during the migrations enforced by ice age conditions.

Of the other plants listed below, the most notable are *Polystichum setiferum*, which is new to East Yorkshire, *Vaccinium intermedium* and *Senecio londinensis*. The *Senecio* hybrid was first found three years ago on bombed sites in London and has since been detected in a few other localities but not previously, I believe, as far north as Yorkshire.

The initials J.B. and C.M.R. have been used in the list for records sent by Mr. Brown and Miss Rob.

\* = new vice-county record.

*Ranunculus trichophyllus* Chaix. (64) Ripon, 'dub' on north side of river; Mrs. J. Appleyard.

*R. Drouetii* F. Schultz. (65) Hartforth, near Scotch Corner; Y.N.U. Excursion.

*Draba muralis* L. (65) Hartforth, near Scotch Corner; Y.N.U. Excursion.

*Arenaria leptoclados* Guss. (62) Skipton-on-Swale; C.M.R.

*Sagina ciliata* Fr. (64) Dry bank near Denton Hall; A. Malins Smith.

*Geranium columbinum* L. (61) Railway bank between South Cave Station and East Dale; Y.N.U. Excursion.

*G. pusillum* L. (63) Field between South Anston and canal; J.B.

*Acaena anserinifolia* Forst. (65) Quarry, Well near Masham; Mrs. Worsley per C.M.R.

*Rosa rubiginosa* L. (62) Pilmoor; C.M.R.

*Callitriche intermedia* Hoffm. (63) Overflow from Dale Dike Reservoir, Bradfield, and in dike near Millmoor football ground near Rotherham; J.B.

*Epilobium montanum* × *parviflorum* (Det. G. M. Ash). (63) Neglected garden in Sandbeck; J.B.

*E. alsinifolium* × *montanum* (Det. A. Malins Smith. Conft., G. M. Ash). (65) Cautley Spout near Sedbergh; G. A. Shaw.

*E. pedunculare* A. Cunn. (62) Moor between Blue Bank, Sleights, and Goathland (Det. A. J. Wilmott); T. Cockerline. (63) Neglected garden, Sandbeck (Det. G. M. Ash); J.B. (65) Stream side between Black Force and the Lune; C. A. Cheetham. (*vide Nat.*, 1947, p. 157).



- Antennaria dioica* (L.) Gaertn. (63) Lindrick Common ; Y.N.U. Excursion.  
*Senecio squalidus* L. (61) Staxton ; E. R. Cross. (62) Crosby Bridge ; C.M.R.  
*S. squalidus* × *viscosus* (× *S. londinensis* Lousley) (Det. J. E. Lousley). (63)  
 Several plants on railway bank between Woodhouse Mill and Beighton ; J.B.
- Cirsium acaule* (L.) Scop. (63) Still in Sandbeck Park ; J.B.
- Vaccinium Myrtillus* × *Vitis-Idaea* (× *V. intermedium* Ruthe). (64) Thorpe and Burnsall Fell, near Folly Top, above Burnsall. Found in December 1947, a single patch which at once attracted attention owing to the persistent leaves, all those of *V. Myrtillus* having been shed ; G. A. Shaw.
- Andromeda polifolia* L. (64) Near Brennand Tarn, Bowland ; G. A. Shaw.  
 (65) Frequent in boggy ground about Woodale between Coverham and Nidderdale ; J. P. Utley.
- Monotropa Hypopitys* L. (65) Near Quarry Gill, Masham ; R. Chislett.
- Trientalis europaea* L. (65) Ilton Moor, Masham ; R. Chislett.
- Myosotis brevifolia* C. E. Salm. (65) Scrafton, Coverdale ; C.M.R.
- Calystegia sylvestris* (Willd.) Roem. and Schultz. (63) Hedges near Aston, Rotherham. Rivelin Valley, with pink flowers ; J.B.
- Verbascum virgatum* Stokes. (62) By the mill at Thornton-le-Dale ; H. Rowntree.
- Linaria repens* L. (64) Disused quarry, Studley, near Ripon ; C.M.R.
- Stachys palustris* × *sylvatica* (× *S. ambigua* Sm.). (63) Several places in Rivelin Valley, also opposite site of old corn mill in Low Bradfield, Loxley Valley (Det. Kew) ; J.B. (64) Nunwick, near Ripon ; Mrs. Worsley per C.M.R.
- Lamium maculatum* L. (62) Ingleby Greenhow ; C.M.R.
- Amaranthus retroflexus* L. (62) Pilmoor ; C.M.R.
- Polygonum Convolvulus* L. var. *subulatum* Lej. and Court. (64) Garden weed, Garforth ; C. E. Goodwin.
- Euphorbia virgata* Waldst. and Kit. (61) Spurn ; Miss Fox per A.M.S.
- X. Ulmus elegantissima* (Horwood) Melville (*U. glabra* Huds. × *U. Plotii* Druce) (Det. R. Melville). Nothomorph near Melville 37·80 in leaf shape ; see *Proc. Linn. Soc.* 151, 1939, 157. (61) in hedgerow, roadside, between Market Weighton and Sancton.—R. Lewis.
- Salix atrocinerea* × *viminialis* (64) Near Reeve Dam, Hawskworth ; A. Malins Smith.
- Lilium Martagon* L. (65) Still in plantation by the river at Aisenby where recorded in Baker's *Flora* ; C.M.R.
- Fritillaria Meleagris* L. (63) Near Hatfield, several plants including albinos in a rough pasture field ; Dr. J. M. Taylor.
- Paris quadrifolia* L. (61) Wood at Nunburnholme, near Pocklington ; Dr. S. P. Rowlands.
- Juncus effusus* × *inflexus* (× *J. diffusus* Hoppe) (Det. A. J. Wilmott). (63) Damp waste ground near North Anston ; J.B.
- J. tenuis* Willd. (*J. macer* S. F. Gray). (63) Canal bank, Eastwood, near Todmorden ; R. P. Libbey.
- J. compressus* Jacq. (63) Field below South Wongs Farm, Sandbeck ; J.B.
- Lemna polyrrhiza* L. (62) Cayton ; E. R. Cross.
- L. gibba* L. (63) Chesterfield canal between Kiveton Park station and Turner's Wood ; also waterway near Canklow above Rotherham ; J.B.
- Potamogeton coloratus* Hornem. (64) Between Foster Flat and Westwick, north of Copgrove ; E. C. Wallace.
- P. pusillus* L. (Det. J. E. Dandy and G. Taylor. (61) In ponds, disused gravel pits, Kelsey Hill, near Burstwick ; R. Lewis.
- P. filiformis* × *pectinatus* (× *P. suecicus* Richt.). (64) In the Ure at Nunwick, Sharow, Ripon and Littlethorpe, and in a tributary at Westwick. In the Wharfe at Leathley, Pool, Arthington, Weeton, Harewood, Netherby, Collingham, Wetherby, Ulleskelf and Ossendyke. (65) In the Ure at Masham, West Tanfield, Norton Conyers and Langthorpe (*vide* Dandy and Taylor in *Trans. and Proc. Bot. Soc. Edin.*, 34, 3, 348-360).
- P. epihydrus* Raf. var. *ramosus* (Peck) House. (63) Near Sowerby Bridge in a part of the canal where it was not previously present ; F. Murgatroyd.
- Carex pendula* Huds. (63) Beeley Wood, near Sheffield ; J.B.
- C. distans* L. (63) Magnesian limestone quarry between Maltby and Tickhill ; J.B.



- C. nigra* (L.) Rich. var. *juncea* (Fries.) (Det. E. Nemes). (63) Banks of overflow channel from Daledike Reservoir, Bradfield; J.B.
- Calamagrostis Epigeios* (L.) Roth. (61) Wood on chalk, Nunburnholme, near Pocklington; Dr. S. P. Rowlands. Rarer apparently in East Yorkshire than *C. canescens* for which an additional locality is a small carrland bog north of Halsham near Withernsea; R. Lewis and John Dahle.
- Cynosurus echinatus* L. (61) Staxton; E. R. Cross.
- Catabrosa aquatica* (L.) Beauv. (64) At 1,250 ft. on Malham Moor in a bog near the Tarn; C.A.C. and W.A.S. cf. *Naturalist*, 1946, 28.
- Glyceria declinata* Breb. (65) Scafton, Coverdale; C.M.R.
- Puccinellia distans* (L.) Parl. (63) Magnesian limestone quarry near North Anston (Det. C. E. Hubbard); J.B.
- Agropyron junceum* × *pungens* (Det. C. E. Hubbard). (61) Sand dunes, Spurn Head; R. Lewis.
- Elymus europaeus* L. (63) Refound at Sun Wood, Shelf (see *Suppl. Yks. Floras*) in 1946, but not seen in 1947; F. Murgatroyd.
- Dryopteris Filix-Mas* (L.) Schott. var. *Borreri* Newm. (61) Weldon's plantation, Winestead, Patrington; R. Lewis. Not discriminated by Robinson so relative frequency in East Yorks. not known.
- \**Polystichum setiferum* (Forsk.) Woynar. (61) In a plantation by the sea at Holmpton Hall, Holmpton; R. Lewis.
- Ceterach officinarum* DC. (64) About a mile west of Clitheroe on the road to Bashall Eaves; G. A. Shaw.
- Nitella opaca* Ag. (65) Skeaby, Scotch Corner; C.M.R.
- \**Tolypella prolifera* Leonh. (Det. G. O. Allen). (61) Pocklington Canal at Storthwaite, August, 1945; G. Taylor.
- T. glomerata* Leonh. (Det. G. O. Allen). (62) Pond at Woodend, Thirsk, with *Chara hispida*; C.M.R.
- Chara delicatula* Ag. (Det. G. O. Allen). (65) Hutton Moor, Ripon, Sharow parish; C.M.R. and Mrs. Worsley.

**Ecological Committee** (Miss D. Hilary) : ECOLOGY OF A HEATHER MOOR.—The ecological survey of a heather moor at St. Ives, Bingley, is still going on, and on the botanical side, is almost complete. Our Chairman, Mr. Malins Smith, has written a substantial article entitled 'Heather Moor Ecology, No. 2,' in which he has dealt with soil profiles, soil analysis, rate of growth and renewal of Calluna and water levels on the Callunetum. This appeared in *The Naturalist* (Oct.-Dec., 1947), and in the same issue is a short report by Mr. Hewson on the Lepidoptera of the area.

On the botanical side there only remains to be completed an account of the recovery from burning. Observations on this are being made by Mr. Libbey, and a further report on this will be issued when the area shows complete recovery to normal conditions.

The chief side of the work on which we need a further report is that dealing with the Hymenoptera, Coleoptera, Diptera and other orders of insects and we hope that Mr. Hincks, in spite of his removal to Manchester, will before long be able to furnish us with this.

**ENTOMOLOGICAL SURVEY OF SPURN.**—From Mr. Hincks comes the news that the Entomological Section of the Union are making a survey of an area at Spurn where they spent ten days in June collecting material. This was, necessarily, only a preliminary survey, but a very large number of insects were collected, Mr. Hincks bringing back over one thousand, and the work already done will serve as a basis for further work.

**DEGENERATION OF JUNIPER ON MOUGHTON FELL.**—No further work has been done on this, but Mr. Cheetham, who has frequently visited the area, reports that he has seen no further extension of the degeneration.

**Bryology** (H. Walsh) : I am glad to report signs of increased activity in the Bryology Section. A spring meeting attended by a few members was held at Bolton Woods and many interesting mosses and liverworts were seen. The Section has lost a promising worker in Dr. J. M. Taylor, whose activity in the Thorne district was adding to our knowledge of that area. Two recent records from there are of county interest, viz., *Riccia glauca* L. var. *subinermis* (Lindb.)

Warnst., new to the Yorkshire list, and a terrestrial form of *Ricciocarpus natans* L. new to V.C. 63.

We are getting a more accurate picture of the distribution of *Fossombronina Wondraczei* (Corda) Dum. in the county. Only previously recorded from V.C. 61 and 62, it is now recorded from the Halifax district, and Dr. J. M. Taylor sent specimens from Thorne, both V.C. 63. Mr. E. C. Wallace records it from Thorne near Leeds, V.C. 64, and also from another station in V.C. 62, Ingleby Greenhow. Mr. Wallace also records *Anthoceros laevis* L. from the same locality, new to V.C. 62.

*Riccia sorocarpa* Bisch. only once previously recorded for V.C. 63 by Mr. Milsom has been recorded from near Halifax and from Thorne by Dr. Taylor.

Mr. A. Thompson records (*Brit. Bryol. Soc. Rep.*, 1946), *Sphagnum auriculatum* Schp. var. *submersum* Warnst., from Doubler Stones Allotment, Rombalds Moor, V.C. 64; and *S. contortum* Schultz, from Malham Tarn Moss, V.C. 64, both new to the vice county.

Moss records of interest are *Buxbaumia aphylla* for Hebden Bridge, new to V.C. 63, and only once previously found in the county; and *Pottia minutula* Fuernr. from earth in a magnesium limestone quarry at Nosterfield, recorded in the *Brit. Bryol. Soc. Rep.*, 1946, as new to V.C. 65 by Mr. E. C. Wallace. Mr. C. A. Cheetham records *Mnium affine* Bd. var. *rugicum* B. & S. for Austwick, V.C. 64, and comments on the presence of *Physcomitrium pyriforme* Brid. at Austwick Moss and *Anoetangium compactum* Schwaeg. from between Black Force and the River Lune.

The Section has been well represented at the excursions. At Scotch Corner, V.C. 65, Mr. A. Thompson collected and lists about 80 species of mosses and liverworts, a few calling for comment. *Eurhynchium praelongum* Hobk. var. *Stokesii* Brill. has only once been previously recorded for V.C. 65 from Whitfield Gill (*Nat.*, 1934, p. 161). *Tortula mutica* Lindb. recorded for near Skeeby Beck appears to be the third record for North-West Yorks., the previous records being from Bedale and Leckby Carr. *Orthodontium gracile* Schwaeg. var. *heterocarpa* Wats. is from a new area and close to the Durham boundary.

At Burton Leonard, V.C. 64, Mr. C. A. Cheetham and Mrs. Appleyard collected three species for which there are only a few records, viz., *Thuidium hystricosum* Mitt., *T. Philiberti* Limpr. and *Pottia intermedia* Fuernr.

*Ephemerum serratum* Hampe. for which there are only a few records has been found by Mr. E. C. Wallace and Miss C. M. Rob at Catton, near Thirsk, V.C. 62.

The Section is anxious to include anyone wishing to pursue the study of these plants and every assistance will be given by advice and identification of specimens. Anyone interested in mosses and liverworts is invited to send specimens for identification with return postage to:—

*Mosses*.—Mr. G. F. Horsley, 2 Beechfield Road, Richmond, Yorks.

*Liverworts*.—Mr. H. Walsh, 1 Dye Houses, Luddendenfoot, Yorks.

Field Meetings in 1948 will be held at Bolton Abbey Woods on Wednesday of Easter Week (March 31st), meeting at 12 noon by the river just above the Strid and at Austwick on September 18th.

**Mycology** (Miss J. Grainger): Many additions to the Yorkshire Fungus Flora have been made at the Forays. These are reported fully in *The Naturalist*. Two species new to Britain will be described by the finders in due course; one is a species of *Erysiphe* found at Sandsend by Dr. Grainger and confirmed by Mr. W. C. Moore at Harpenden by a further record; the other is a Hyphomycete collected by Mrs. Mason at Jervaulx and determined by Mr. S. J. Hughes.

Papers published by members of the Committee include:

The Agarics: A Critical Survey, by A. A. Pearson. *The Naturalist*, 1947, 1-8.

Entomycology, by W. D. Hincks, *The Naturalist*, 1947, 111-116.

New Records and Observations, III, by A. A. Pearson, *Trans. Brit. Mycol. Soc.*, 1946, 29, IV, 191-210, with plates.

A Revision of Ceylon *Marasmi*, by T. Petch. *Trans. Brit. Mycol. Soc.*, 1947, 31, 19-44, with plates.

Ecology of *Erysiphe graminis* DC., by John Grainger. *l.c.*, 54-65.

Jakob E. Lange, 1864-1941, by A. A. Pearson. *Mycologia*, 39, 1, 1-4, 1947. Plate.

Carleton Rea, 1861-1946, by A. A. Pearson and L. Richardson. *Transactions Worcestershire Naturalists' Club*, Vol. X, Pt. 2. Plate.

Arrangements are being made to hold a Spring Foray at Sheffield, April 8th-12th, and the Autumn Foray at Masham, September 24th-28th.

## MAMMALS, REPTILES, AMPHIBIANS AND FISHES

**Mammalia** (Mrs. A. Hazelwood) : **CHIROPTERA**.—A few pairs of *Pipistrelle* Bats are recorded from Hebden Bridge, one having been found in a bedroom on May 23rd. Around Wakefield, Bats have been 'extremely scarce' this year, although last year *Pipistrelles* were common enough, and around Halifax they have completely disappeared from an old-established haunt, the outbuildings used by the Bats being situated on a sewage farm which is a great breeding ground for dipterous flies which frequently rise in clouds so that in this case lack of food is certainly not the cause of their disappearance. Other naturalists in the Halifax area say they have not seen a single Bat this year. Mr. Garnett reports that *Noctule* Bats have not been so noticeable around Thornton-le-Dale; the only one he saw was flying north up the dale on August 19th.

**INSECTIVORA**.—The only notes *re* the Hedgehog state that they appear to be in about their usual numbers, and that a juvenile, aged about five weeks, was found near Hebden Bridge on July 30th. The skins of two Hedgehogs were found at a fox's earth. The usual numbers of adult Hedgehogs were found killed on the roads around Keighley. A medium-sized Hedgehog was found in the hole under the boiler of a well grate in a house at Cross Hills. A small fire had been left burning there the previous night but the Hedgehog had cleared the grate by scattering the cinders on to the carpet and raking the ashes on to the tiles. An albino mole is reported from Huddersfield in July, and a cinnamon-coloured specimen from Hebden Bridge on June 2nd. Moles also appear to have been in their usual numbers and embryos, almost fully developed, were found in an autopsy on April 26th. Only a very few Pygmy and Common Shrews are recorded; dead specimens were found in July, one on a path through a cornfield at Choppards, near Holmfirth, and the other on a path through West Wood, Honley. Water Shrews were seen diving for food during the worst of the bad weather in early January, near Hebden Bridge, and at the end of March the males were seen to be very aggressive and active. At this time the Water Shrews travelled both sides of the mill dam, frequently crossing on the surface at great speed, the body being carried high in the water whilst swimming, giving the impression of the animal's running on the surface of the water rather than swimming; every few yards the animal would dive, come up, then dive again. The males avoided each other whenever possible, but when any contact was made, without exception it ended in a fierce fight. Mr. Dean picked up two males, still fighting, in his hat, but they fell out and resumed their fight on the surface of the water. Mr. Dean also observes that they seem to have an acute sense of smell, as the males followed the females by scent wherever one had touched the bankside.

**RODENTIA**.—Around Hebden Bridge Rabbits are scarce due probably both to the depredations of the foxes and to the long period of snow and gales which completely cut off their food supply. They are also less numerous in the Helmsley and Halifax areas, although around Hull the population is steadily recovering. Near Bolton Percy, white liver is recorded amongst the young Rabbits. Mr. Utley sends the following note: 'On Sunday, March 23rd, after much of the snow had melted, my boy found a Rabbit's nest. This was in a lane which shortly before had been completely covered by a bank of snow about a hundred yards long, fifteen yards wide and five feet deep. The nest was a ball of dried grass and fur underlaid with straw and it held four young, naked and still blind. The nest had been built in the snowdrift, about a foot above ground and was approached by a burrow through the snow. It was quite dry inside though all the snow above had melted.' Unfortunately the nest, once revealed, was soon destroyed. A few Brown Hares are recorded from various suitable localities and an Alpine Hare was shot near Huddersfield in April.

On May 14th Mr. Parsons saw a Red Squirrel in Chevet Woods, Newmillerdam. Three pairs released near Hebden Bridge in 1942 have extended to other woods, although a few casualties have been reported; no Grey Squirrels are reported from Hebden Bridge. Only Red Squirrels have been recorded at Wassand (Hornsea Mere) until recently, but this year there have been two Grey Squirrels there also.



They are described as a 'nuisance' in Becketts Park, Leeds. Mr. Garnett reports Grey Squirrels abroad during the very severe weather; he saw one digging in the snow on February 12th and two were about a quarry in Thornton-le-Dale on March 2nd. Grey Squirrels in pies are described as 'marvellous,' far better than rabbits. Some were picked up dead in Duncombe Park. Grey Squirrels have been seen on several occasions near Glusburn Corn Mills.

Messrs. Taylor and Gordon consider Water Voles to be rather more plentiful on the Rye this year. Mr. Dean reports the following for Hebden Bridge area: Odd tracks of Water Voles were observed over the ice-covered dams and canals on January 9th, and on the 10th the first one seen on the canal had travelled a hundred yards over the ice to a reed bed for food. The same happened on February 24th and one was seen on Lee Mill dam. There was little activity until March 30th when a nest was found made of dried soft grasses under a snow-drift (altitude 300 feet). The nest was also made of Sycamore wings and a few *Poa* seeds among which there were the casings of caddis larvae. This nest was teeming with mites. Fighting occurred amongst the males on April 25th and mating was noticed at Lee Mill Dam on April 30th. A few Water Voles were seen on the River Aire at Gargrave on May 6th. The colony at Lee Mill is considerably less in numbers than last year. Those which had survived the winter were apparently in fairly good condition, but food was in short supply early this year and the Voles at this place had to search for it much further from the dam than normally. In addition to their feeding on grasses, leaves floating down the dam, and other young shoots, these Voles seem very fond of willow buds and leaves which they eat all through the season. To obtain this food they climb to a height of one to two yards up into the clusters of the lower branches which overhang the dam and from this height, if they be disturbed, they drop straight down into the water. They have been seen to eat continuously for twenty minutes at great speed. The males seem to travel further distances than the females, but all avoided the nest of a brooding Water Hen by some seven feet or more. When the females begin to carry in nesting material, the males are driven away from the area and are not tolerated near the nesting site. Quite often Mr. Dean witnessed the females repeatedly diving under water with nesting material when about two feet from the bankside. When making new holes the periods of submersion vary between twenty and forty seconds. Mating and nest building was again noticed on May 12th. One Vole was seen to eat four whole fern fronds at one meal; garlic is left untouched. The first young were seen out feeding on August 3rd. Bank Voles in the same area seem to have fared fairly well under the snowdrifts judging by the amount of bitten-off grasses near their runways. They have also eaten well down into growing shoots. Tracks in the snow of one of these creatures were seen for a considerable distance at High Royd on January 3rd. The Short-tailed Field Vole is also recorded for Hebden Bridge.

We hear much about the savage disposition of the Brown Rat, but the following incident brings to our notice the other side of the balance. A pair of Water Hens with a young brood lived on a small dam behind Midge Hole Dyeworks near Hebden Bridge. An adult Brown Rat approached. Firstly, the hen bird flew at it, at which the Rat dived and came to the surface again about eight or ten yards away. This process was oft repeated, then, as the Rat tired, the Water Hens took turns at holding the Rat's head under water; at one time they both were holding it by the scruff of the neck and eventually succeeded in drowning that Rat.

**CARNIVORA.**—Foxes are reported to have been reduced in numbers in the Helmsley district. A litter of four cubs which had been seen running in and out of the earth whilst the snow was still on the ground was killed on April 14th near Hebden Bridge; in May twenty Foxes were killed in that district in one week, chiefly cubs and vixens. A farmer in the Cragg Vale district has killed more than sixty Foxes during the past few years. Todmorden observers report that many Foxes have been shot in that area and that they appear still to be on the increase. Only a few odd Foxes are reported from Craven. Poultry keepers at Wellhouse, near Golcar, suffered much from depredations of Foxes and an organised shoot resulted in a dog Fox being shot. Around Hull they are reported to be more numerous than formerly, despite the demand for their pelts. The Secretary of the Dales Fox Fund reports that Foxes killed in the last five seasons were: 1942 (9 months only), 166; 1943, 216; 1944, 236; 1945, 350; 1946, 288. During the past year losses in the area were 300 lambs and 500 head of poultry. During



the past season £169 15s. had been paid out for tails. Subscribers and members totalled 182 so that their efforts raised approximately £1 per head.

Badgers are reported from Leconfield and Linton-on-Wharfe ; one was shot just above the railway station at Clayton West on April 24th, and a boar Badger was caught in a fox trap at Brockholes on September 15th. This last animal weighed 22 lbs. Badgers are holding their own in the Rye Valley. An adult sow was run over and killed by a car near the junction of the Leeds-Selby road about April 12th. On May 6th a complete skull of an adult was found outside a sett at Eshton ; it was obvious that the sett was still occupied as well-worn paths led to and from the entrance, fresh droppings were found in their small dugout latrines and freshly-cut greens of the bluebell and garlic were scattered inside the entrance of the sett. At Winterburn the Badgers have quite a stronghold and attempts to trap them have so far been quite unsuccessful, although the traps are often found to have been sprung, no doubt by the Badgers having rolled upon them. It is reported that in a deep gorge where there is a sett, during the arctic gale early this year the Badgers slid down to their setts instead of walking, and that these slides became quite well worn and brown coloured with the usage. On July 15th a young male, aged about 14-16 weeks, was shot in daylight at Friars Head Farm between Winterburn and Eshton. In a nearby wood was located another sett inhabited only by a single adult pair and an odd youngster or two, judging from the tracks ; although there were many feathers about the place (Rook, Crow and smaller birds), none were from domestic poultry. A few torn rabbit skins and bones were also noticed and in some places the bark of fallen trees had been ripped off and the moss had been turned over by the Badgers in search of insects.

An Otter is reported to have arrived at Malham Tarn and another has been seen several times visiting the Melton clay pits on the Humber bank, and a pair of Otters which may have come from Hornsea Mere, where a pair have bred, has been seen during the spring at Burton Constable. A pair of Otters was trapped on the River Rye, near Helmsley, in April. Tracks of adult Otters were found in the mud and sand at Addington below the mill, and at Clitheroe, below Brungerly Bridge, a holt was located in a reed-covered drain ; a resident angler said he had seen the bitch and kittens a few nights previously.

Six Stoats were shot at Haworth. Apart from this record there is nothing to report except that near Hebden Bridge a bitch and her litter were worried on May 16th, and another bitch and her litter on the following day ; both bitches were in a very poor condition, just skin and bone. Two dog Stoats were killed later some distance away. A Rough-legged Buzzard shot at Hornsea contained a whole Stoat in its stomach ; both Buzzard and Stoat have been mounted for the Hull Museum.

A number of both Atlantic and Common Seals have been seen off the East Riding coast during August and Messrs. Lord and Ainsworth witnessed a Seal playing with its capture as Seals do. The following is their note. On the afternoon of August 31st they saw an Atlantic Seal about fifty yards off shore near Kilnsea Warren, holding a very large ray by the head. The fish lashed furiously with its tail and 'wings' as the Seal held it in the air. Holding the fish out of the water for about a minute the Seal released it, then submerged and brought up the ray still held by the head and still very much alive. This was repeated for twenty minutes, after which the Seal tore large pieces off the fish and swallowed them whole.

**CETACEA.**—A school of Porpoises appeared off the mouth of the Humber during early August and Mr. Ainsworth found this rather interesting, as he had not seen them there since 1939, although each summer Porpoises could be seen in Bridlington Bay off the pier.

**UNGULATA.**—Although the Duncombe Park herds of Red and Fallow Deer no longer exist, a small number of both species are still at large in the extensive woods under the control of the Forestry Commission in the neighbourhood of Wass. The horns of Red Deer have been found on newly ploughed-up ground at Winterburn and in Flashby Wood ; the area around Gargrave was noted in the past for the hunting of Deer.

**Reptilia** (Mrs. A. Hazelwood) : The Viviparous Lizard is recorded as 'much in evidence' amongst the chalk on the north bank of the Humber. On May 24th

a Slow-worm measuring 12 in. was found in a wood near Loop Scar, Burnsall in Wharfedale.

On June 15th an Adder measuring 23½ in. was seen on the top of Deadman's Hill, between Coverdale and Nidderdale. Another Adder, of a ruddy brown colour, was seen on Great Haw on July 13th. A keeper at Dalby reports that up to the middle of June this year he had only killed some seven or eight Adders instead of the usual forty or fifty.

**Amphibia** (Mrs. A. Hazelwood) : A pond at Stocksmoor was almost dried up by mid-July, but a few Great Crested Newts were inhabiting the oozy mire underneath large stones. During the war the military sank some wells in the sand dunes at Spurn in the hopes of obtaining fresh water. Mr. Ainsworth found a Palmated Newt clinging to the walls of one of these wells, just above the water line.

In the Huddersfield district, frequent pond visitations failed to give an earlier date than April 13th for frog-spawn, this being at Dean Wood, Cawthorne, followed by spawn at the Newsome pond on the 19th. In each case the spawn masses were in greatly reduced quantity compared with some past years. The first tadpoles were seen in a pond on the moorland edge at Holthead, and here also was a fair amount of 'eyed' spawn. In a pond below Tinker's Monument, Newmill, the leg stage was noted on July 22nd. On August 13th young Frogs were abundant in Gunthwaite Wood and in the vegetated margin of Gunthwaite fish pond. Mr. Garnett reports that Frogs were rather later than usual in reaching the spawning pools around Thornton-le-Dale this year. They were seen at Keld Head on March 23rd, but there was no spawn on that date. At Stanley Old Reservoir, near Wakefield, many hundreds of Frogs were to be found by April 15th. On three successive days in April (25th to 27th), when mating and spawning were in full swing, Mr. Parsons noticed seven Frogs clasping some floating object firmly (he had occasionally noted this before). On hauling the Frogs off, it proved to be a dead rat. In another pond where there was a great excess of male Frogs, five were seen bunched together. On March 16th, at Stanley Old Reservoir, Wakefield, a heron was under close observation. It was looking for food in a small stream which was flowing freely, but there was snow on the ground. The bird probed with its beak in the mud, extracted a Frog, flew a short distance, and then swallowed the Frog, which was far from torpid to judge from its lively convulsive limb movements.

Toads, both adult and young, were noted in the vicinity of Dean Wood, Cawthorne, on August 13th. Belle Vue Museum, Halifax, had a small tank as a vivarium, in which were a few frogs and toads and a young grass snake, which had lived together for about a year. The grass snake measured about 9-11 in. On June 16th one of the common toads commenced to eat the grass snake, and on the following day the posterior half of the snake was still hanging out of the toad's mouth. Altogether it took the toad some three days to complete its meal. On October 10th a Common Toad was caught in the machine shop of Mr. W. Slingsby in Woodhouse Road, Keighley : the River Worth flooded its banks on September 20th and flooded the works to a depth of 3 ft.

**Pisces** (Mrs. A. Hazelwood) : Professor Spaul reports that in May he came across a larval Lamprey (*Ammocoetes*) in a sample of algae obtained from the outlet of a tunnel connecting Leighton Reservoir (near Masham) with Swinsty, so that the larva may have come through from the Ure. The Lamprey occurs in most Yorkshire rivers, but not so far up, in fact not much above Knaresborough on the Nidd or Tadcaster, where it often spawns under the bridge, on the Wharfe.

In January a hen Pike aged ten or twelve years, which weighed 22 lb. 14 oz. and was 42 in. long and 18 in. in girth, was caught in the River Ure at Borough-bridge. The bait was a 4 oz. Roach.

Mr. Appleyard, of Leeds, sent a Spinous Loach for identification ; he had caught it in the canal at Kirkstall, Leeds. There is no record for this fish in Denison & Roebuck's handbook.

A Skate, weighting 11 lb., was caught at the angling festival inshore at Bridlington.

A Chub, weighing 1 lb. 7 oz., was caught by Mr. G. Strickland during the Amiable Brothers' Cup Competition by the Hebden Bridge and Sowerby Bridge Angling Societies on the River Derwent at Weldrake, near York. During one

afternoon in August, Mr. Walker, fishing in Thornton Beck (a tributary of the River Nidd draining Ripley Castle lakes) caught Chubs of the following dimensions :  $15\frac{1}{2}$  in., weighing 1 lb. 12 oz. ; 15 in., 1 lb. 8 oz. ;  $14\frac{1}{2}$  in., 1 lb. 6 oz. ; two fish each  $14\frac{1}{2}$  in., weighing 1 lb. 5 oz. ;  $13\frac{1}{2}$  in., 1 lb. 1 oz. ; 13 in., 14 oz. ; and  $12\frac{1}{2}$  in., 15 oz. From the same weir pool a few days previous a hen Chub was taken measuring 13 in. and weighing 1 lb. 4 oz.

A Barbel, weighing 7 lb., was caught at Burstwick, and one of 5 lb. was caught in the River Ure at Boroughbridge but was returned to the water alive. This stretch of the Ure contains Salmon (at the right season), Pike, Perch, Trout, Grayling, Chub, Roach, Dace, Bleak, Gudgeon, Ruffe, Minnows and Eels, apart from the above-mentioned Barbel, of which there are quite a few.

A Grayling, weighing 1 lb. 5 oz., was the largest Grayling caught in the Harrogate and Claro Angling Association's water in the River Nidd, near Ripley, during 1946. Mr. Walker reports that he cleaned a Grayling on September 29th, (length 12 in., weight 9 oz.) which had in its stomach a small fish about  $1\frac{1}{4}$  in. in length and which looked like a young trout, though at this size and as it had been in the stomach about 36 hours, one could not be certain of its identity. Incidentally, this Grayling had been caught on fly.

A hen Trout measuring 19 in., girth 10 in., weight 2 lb. 10 oz., was caught on 'brown owl' fly on August 12th in the Killingholt length of the River Nidd. The Trout there are reported to be in excellent condition and fairly numerous. This year the Club which rents this water is stocking with 500 two-year-old Brown Trout. (Mayfly hatch was very poor as there was a heavy rainstorm on June 14th and again on the 15th. After this rain very few mayfly were seen.) In the Thornton Beck, Trout are not in very large numbers, but there are a few of good size, e.g. Brown Trout, length  $14\frac{1}{2}$  in., weight 1 lb. Another of the same length weighed only 14 oz., but in this case the latter half of the gill covers were missing, exposing the rear portions of the gills, the fish was developing a hooked jaw, and it also had a louse near the tail. Three years ago the upper reaches of Crimble Beck were stocked with about 200 two-year-old Trout. Now these fish have grown to quite a decent size. The fish have also bred and there are quite a number of young fish, 3-4 in. in length. The maximum weight of fish seems to be about  $\frac{3}{4}$  lb., but on the whole they are thin, e.g. an 11 in. fish weighed only 7 oz., and another of 12 in. only  $10\frac{1}{2}$  oz. There are no Minnows present in this length of the beck. Thousands of young Trout, a number of Roach and a few Perch have been introduced into the Rochdale canal at Hebden Bridge ; it is already well stocked with Sticklebacks, Gudgeon and Loaches. One Trout caught there had 18 Sticklebacks in its stomach. At Burstwick, some 2,000 Rainbow Trout have been introduced (1947) ; weight about  $4\frac{3}{4}$  lb., length 18-20 in.

It is recalled that there have been a few Trout in the Hebden canal for very many years and their origin is now recorded. It would appear that many years ago a farmer built a small dam when he was a boy for water storage purposes, and just for his own amusement he had released a few dozen Trout into it. Later a flood broke down his dam, thus releasing both water and fish into the canal. These Trout use a small freshwater stream for the purpose of spawning.

Trout also occur in the Hardcastle stream, near Hebden ; these fish were introduced by Lord Saville a number of years ago. Unfortunately, periodically when repairing the reservoirs higher up, some cement gets into this river and causes many fatalities which are washed up at the stream side. Trout in this river have been seen in lower reaches than in past years. This river is now almost free from dye and trade effluent until it joins up with the Calder at Hebden Bridge. The Calder, flowing down from Todmorden, is still bad, although it is receiving attention from the Water Board.

There was a loss of over a thousand well-developed Roach in the Hebden Bridge Angling Society's section of the Rochdale Canal early this year, which was investigated by members of the West Riding Rivers Board. These fish were heavily infested by *Saprolegnia*. Three possible causes for this high mortality have been suggested : 1, over-population ; 2, introduction by young Roach which were put into the canal last winter ; 3, the entry of some polluting element into the water as a result of the big storm and flood on May 30th. Rock salt was tipped into the canal, but that section is to be lowered this year for repairs and it is hoped that the releasing of the water will clear up the trouble.

Professor Spaul reports that he has continued to find parasitised Sticklebacks,



Roach and Trout in Thrybergh and other places. The Sticklebacks and Roach have the tape-worm infection previously recorded, but the Trout appear to be infected by *Diphyllobothrium*.

I have to thank the following for their valuable assistance in the compilation of this report : G. H. Ainsworth and C. F. Procter (Hull), E. W. Aubrook (Tolson Memorial Museum) and W. E. L. Wattam (Huddersfield), S. E. Evans (Cheadle Hulme), J. P. Utley (Northallerton), A. G. Parsons (Wakefield), W. Greaves (Halifax), F. Dean (Hebden Bridge), E. W. Taylor (York), W. G. Bramley (Bolton Percy), R. M. Garnett (Thornton-le-Dale), Rex Procter (Wetherby), R. Chislett (Masham), A. G. Walker (Harrogate), F. H. Edmondson (Keighley), E. A. Spaul and S. G. Appleyard (Leeds), and A. Butterfield (Hon. Secretary, Cross Hills Nat. Soc.).

## ORNITHOLOGY

**Interim Report** (Ralph Chislett) : A winter of abnormal severity caused abnormal movements among birds, many casualties, and subsequent serious diminution in numbers of many species. The full Report of the Committee due for publication in April will include detailed assessments of the effects produced. The extraordinarily fine and warm summer that followed also had its effects.

The Committee was officially represented at four of the five field meetings of the Union, useful contacts with ornithological members being made.

Quails have been recorded during the summer in several areas, and nesting was proved in at least two West Riding districts.

Among the unusual birds recorded inland must be included the Golden Oriole, Kentish Plover and Little Ringed Plover. Coastal passage migrants in spring included the Ortolan Bunting and the Black Redstart, and in autumn the Red-breasted Flycatcher, Black Redstart and Wryneck.

The Wild Birds Protection Acts Sub-Committee has continued to watch over the Montagu's Harriers (one pair was known to breed successfully). At Spurn our watcher experienced much difficulty with picnic parties from cars and the Little Terns were affected seriously. The problem of their adequate protection is being considered but is not easy to solve.

The Spurn Observatory is having a successful season, and has been manned much more continuously than in 1946. Valuable improvements to the trap and to the trap-box have been carried out by G. H. Ainsworth and his helpers. The new 'Ainsworth' trap-box is very well designed and enables a number of birds to be dealt with expeditiously. These factors have resulted in an increase in number of birds ringed : 423 having been ringed in 1947 up to October 12th as against 299 for the whole of 1946. Forty-three species have been trapped including Brambling, Black Redstart and Wryneck.

The Observatory visitors' book has been signed up to October 12th by 65 persons, most of whom have stayed in the cottage. The Y.N.U. Entomological Section held a meeting there for a period in June. A number of ornithologists from outside Yorkshire have stayed there. Warm tributes have been paid by all to the work being done in the name of the Y.N.U. Bookings for 1948 should be made as early as possible.

The Sub-Committee desire to thank the many helpers who have done so much to add to the amenities of the cottage and to improve the Heligoland trap. Among gifts too numerous to enumerate mention should be made of the alarm clock from the Hull Scientific Society and of the generous contribution by a member towards the cost of a barometer. G. H. Ainsworth has added to his many contributions by constructing a weathervane, which should be fixed shortly, and R. M. Garnett has constructed a bird drinking-pool. The collection of books was recently added to by several from C. W. G. Paulson.

A Meeting of the Observatories Committee of the British Trust for Ornithology held at Dale Fort, Pembrokeshire, was recently attended by our delegate, R. M. Garnett.

The detailed Annual Report for 1947 will be considered at the meeting of the Vertebrate Section to be held on Saturday, March 13th, 1948. Members are requested to send their final batches of notes to the Recorders as soon after December 31st as possible, and the major portion before that date, so that the Report can be got into type and proofs circulated in good time before the meeting.



## CONCHOLOGY

(Mrs. E. M. Morehouse) : This year we have had a good time on the whole. When the hot weather set in land mollusca were few, and freshwater species often suffered by drying up of ponds, etc., causing summer hibernation.

The late spring and early summer slugs were much in evidence.

Twenty-one species, including four slugs, were taken on the occasion of the Yorkshire Conchological Society and Doncaster Scientific Society's visit to Little Smeaton and Broc-o-dale. Included in these records, though not plentiful, was *Caecilioides acicula* Fér. *Vallonia pulchella* Müll. was also found. The 'bag' would have been much larger but for the high wind; not one *Helix nemoralis* L. was seen on the Smeaton-Wentbridge road, where hundreds can usually be gathered.

The Doncaster Scientific Society had an excursion to Drax on July 12th. Only four species were taken, with a good series of varieties of *H. nemoralis* L. and *H. arbustorum* L., the shells of the latter being rather thin in texture. Drax would be worth a closer investigation.

On July 19th the Yorkshire Conchological Society's rendezvous was Ripley. The chief interest here was the attempt to confirm an old record of *Unio margaritifera* L. Although two members waded, after prolonged investigation nothing was found. However, on the shores of the Ripley Park Lake, seven species were taken including *Succinea pfeifferi* Ross and *Planorbis albus* Müll.

Mr. J. Lumb says he has a small pool of water in his garden, which during the winter was 5 in. deep with water; this was frozen solid. In the pool were *L. pereger* Müll., *L. stagnalis* L. and *Bithynia tentaculata* L. When the thaw set in both the *Limnaea*s were alive but not one *Bithynia*.

Mr. E. Arnold Wallis, while at Appleton-le-Moors, Kirbymoorside, found 21 land and freshwater molluscs within 2 miles of the village. Following each name he records : rare, plentiful, etc., a most useful comment for others who wish to follow up investigations in the same area. *Sphaerium lacustre* Mull, *Balea perversa* L., *Helicigona lapicida* L., *Jaminea cylindracea* da Costa, *Helicella itala* L. and *Vertigo pygmaea* Drap. were, I think, the outstanding species.

My daughter and I during two visits to Sandsend, Whitby, did a little shore work, but were very disappointed with the results. Certain species for which we particularly looked appeared entirely absent, although Dr. Marie Lebour records them in *The Naturalist* in 1901 and I have taken them at Scarborough. Among the thousands of *Nucella lapillus* L. were many which looked as if they had been either broken or retarded in growth, the latter part of the shell being quite smooth. A small stream flowing over the cliff, evidently impregnated with iron, had covered a few *Patella vulgata* L. with a rust covering. One *Littorina littorea* Fér. measured 37 mm. x 29 mm. *Patina pellucida* L. on *Laminaria saccharina* was particularly fine.

## ENTOMOLOGY

**Ephemeroptera** (John R. Dibb) : The few observations and records received during the year tend to show a rather better Mayfly year than in 1946, although there are no records of prime interest in connection with the occurrence of rare species in the County. This is not surprising, because during recent years a considerable interest has been taken in this small order of insects in Yorkshire and the County list is now a very good one.

A good rise of *Baetis pumilus* was noted at Boroughbridge during the first week of July, 7 p.m. G.M.T., and a fair rise of *Centroptilum luteolum* at Goathland, 2/9/47, 6 p.m. G.M.T., the latter being chased by Wagtails. At Ingleton, between July 27th and August 2nd, several batches of *Ecdyonurus venosus* were 'dancing' in small numbers, the only other two species seen during this period being a few *Baetis rhodani* and *Ephemerella ignita*.

Mr. Whitehead's record of four males and two females of *Ecdyonurus dispar* from Goathland (4/9/47) provides us with a new station for the species.

We are indebted to Messrs. Whitehead (H.W.) and Hincks (W.D.H.) for the records of the species listed below not otherwise acknowledged.

*Baetis bioculatus* Lin. Masham, 18-19/10/47 (W.D.H.).

*B. pumilus* Burm. Boroughbridge, early July, large numbers (J.R.D.).

*B. rhodani* Pict. Kingsdale, Ingleton, 27/7—2/8/47 (J.R.D.); Masham, 18-19/10/47 (W.D.H.).

*Ephemerella ignita* Poda. Kingsdale, Ingleton, 27/7—2/8/47 (J.R.D.) ; Masham, 18-19/10/47 (W.D.H.).

*Centroptilum luteolum* Eaton. Goathland, fair rise, 2/9/47 (H.W.).

*Ecdyonurus venosus* Fab. Goathland, 4/9/47 (H.W.) ; Kingsdale, Ingleton, 28/7/47 (J.R.D.).

*E. dispar* Curt. Goathland, 4 ♂♂, 2♀♀, 4/9/47 (H.W.).

**Heteroptera** (J. M. Brown) : I have nothing very striking to report in the way of captures made during the past season. Specimens collected by W. D. Hincks during the Kilnsea meeting (14-16/6/47) and sent to the recorder included *Corixa stagnalis* (Leach), *C. semistriata* (Fieb.), *C. falleni* (Fieb.), *C. affinis* Leach, *C. nigrolineata* (Fieb.), *C. striata* (L.), *Notonecta glauca* L. and *Gerris lacustris* (L.). At Burton Leonard (19/7/47), H. Whitehead obtained *Corixa punctata* (Illig.) *C. sahlbergi* (Fieb.), and *C. nigrolineata* (Fieb.) and from Leeds *C. punctata* (Illig.). C. A. Cheetham supplied *Tricophora vulnerata* Germ. from Anston (5/6/47) and *Aphrodes bifasciatus* (L.) from Penyghent.

From the Robin Hood's district the recorder obtained *Tingis cardui* (L.) and *Plagiognathus arbustorum* (Fabr.) from thistle-heads ; *Dicyphus epilobii* Reut. from willow herb ; *Acanthosoma haemorrhoidale* (L.) from hawthorn (26/9/47) ; and in the garden *Lygus spinolae* M.-D. on red *Spiraea* (15/7/47) in all stages, *Calocoris sexguttatus* Fab. (5/8/47), *Heterotoma meriopterum* (Scop.) (28/7/47) on rasps ; *Dicyphus pallidicornis* (Fieb.) on foxglove (5/8/47) ; *Lygus viridis* (Fall.) (28/7/47), *Calocoris norvegicus* Gmel. (6/8/47), *Orius majusculus* (Reut.) (25/8/47) and *Phytocoris ulmi* (L.) (28/7/47).

**Neuroptera, etc.** (J. M. Brown) : Green Lacewings were plentiful in the garden during late summer, but all captured proved to belong to *Chrysopa carnea* Steph. This species also occurred in the house on March 2nd and again on October 12th.

The season seems to have been a good one for Dragon-flies, the best species noted being *Cordulegaster boltonii* (Don.) taken by J. H. Flint, hawking over a moorland stream on Langbar Moor, Ilkley (23/7/47).

Chris. A. Cheetham adds : Dragon-flies have been few at Austwick and many of the smaller species were missed. At Austwick Moss, *Pyrhosoma nymphula* was much reduced in number, and so was *Sympetrum scoticum*, and these are normally very plentiful. The large *Aeschna juncea* seemed about normal, but never occurs in large numbers. The fine autumn kept *scoticum* and *juncea* on the wing to October 14th, and on this day I noticed that the females of *scoticum*, which are normally a light yellowish-brown shade, were quite as dark as the normal black males.

Mr. Brown concludes : I have nothing special to note regarding Psocids except the abundance indoors of *Trogium pulsatorium* L. *Amphigerontia bifasciata* (Latr.) occurred on hawthorn in the garden.

Of Thysanura, the Silver-fish *Lepisma saccharina* L. was unfortunately present in some numbers in a cardboard micro-slide box, where it was obviously breeding.

**Trichoptera** (H. Whitehead) : In my experience the season 1946-47 has been a very poor one for Trichoptera. A week's collecting at Goathland in early September failed completely, although the same ground was worked last year in July and proved quite satisfactory.

Mr. W. D. Hincks has again allowed me to examine specimens taken by himself and Mr. J. Wood during the past few years. There were 53 specimens, but these furnished no new county or vice-county records ; most of the specimens being from localities already recorded.

In addition, Mr. Hincks has sent me a list of his captures in 1947, and of these five species are new to V.C. 65. Mr. B. A. Cooper gave me two caddises from new localities. The following is a list of species from the new localities, those which are marked with an asterisk\* are new to V.C. 65.

\**Grammotaulius strigosus* (Curt.) = *atomarius* F. Spurn, 16/6/47 and 19/6/47, both to light ; Masham, 12/10/47 (W.D.H.).

*Limnophilus rhombicus* L. ♀, Askham Bog, 1/6/46 (W.D.H.).

*L. centralis* Curt. ♀, Grass Woods, 2/5/45 (W.D.H.) ; ♂, St. Ives, Bingley, 1/6/46 (J.W.).

*L. vittatus* F. ♂, St. Ives, Bingley, 8/9/45 (J.W.).

*L. auricula* Curt. ♀, St. Ives, Bingley, 29/9/45, (J.W.).

*L. sparsus* Curt. ♀, Terrington, 22/5/45 (B.A.C.).

- \**Anobolia nervosa* Curt. Masham, 11/10/47, Jervaulx, 13/10/47 (W.D.H.).  
*Stenophyllax stellatus* Curt. ♂, Ling Ghyll, Horton-in-R., 19/8/42 (W.D.H.);  
 ♀ on window pane at light, Chapel Allerton, Leeds, 21/8/47 (H.W.).  
*S. permistus* McLach. ♂, Ling Ghyll, Horton-in-R., 29/8/42 (W.D.H.).  
*Micropterna sequax* McLach. Masham, 12/10/47 (W.D.H.).  
 \**Halesus radiatus* Curt. Masham, 13/10/47; Swinton Park, 14/10/47 (W.D.H.).  
*H. digitatus* Schrk. Masham, 12/10/47 (W.D.H.).  
 \**Chaetopteryx villosa* (F.). Masham, 17/10/47; Jervaulx, 13/10/47 (W.D.H.).  
*Odontocerum albicorne* Scop. ♂, Ruswarp, 18/8/36 (B.A.C.).  
*Plectrocnemia conspersa* Curt. ♂♂, Douk Ghyll, Horton-in-R., 5/7/42 (W.D.H.).

**Lepidoptera** (E. Dearing) : Remarkable weather has been experienced during the season : from late January to mid-March the county was influenced by arctic conditions, and such outstanding snow depths as 20 inches at Huddersfield and 44 inches at Forrester-in-Teesdale were recorded on February 6th. The thaw produced unparallelled floods, and a short spell of normal conditions was followed by drought from July to September.

Such severity of climate must affect the emergence of imagines, and it was noted that many spring species were later than usual, whilst some summer emergences may have suffered from drought. 'At Elland,' writes Mr. H. Spencer, 'there had been "swarms" of the more common species at sugar in June and July, but as the relative humidity fell below 90 per cent. in August there have been scarcely any coming.'

Species which have been other than scarce include the 'Whites,' whose larvae have ravaged the domestic and arable crops of Brassicas. In many cases three broods have been noted, and Mr. Spencer suggests that the underside of the third brood of *P. napi* L. exhibited a more pronounced yellow tinge. The large numbers of Clouded Yellows which have been seen in all parts of the country have received much comment from all quarters. Mr. D. M. Jesper suggests an interesting point : 'From a captured female I bred good specimens, males emerging a week or ten days before the females—possibly this fact may prevent inbreeding in Nature.'

Mr. Jesper assembled *S. pavonia* L. at Brimham Rocks on 17th May. Males in abundance found the female within a minute. The female had emerged five days previously and had already laid infertile eggs, but she laid fertile eggs within 90 minutes of being mated. As many as 25 males were assembled at the same time.

Reports have been submitted by the following observers, to whom thanks are tendered :

Miss M. E. Ackerley (Long Preston), M. D. Barham (Leeds), W. Barraclough (Low Moor), E. G. Bayford, F.R.E.S. (Barnsley), P. Blasdale (Wombwell), J. M. Brown, B.Sc., F.R.E.S. (Robin Hood's Bay), W. Buckley, F.Z.S., (Skelmanthorpe), J. R. Dibb, F.R.E.S. (Leeds), C. A. Cheetham, F.R.E.S. (Austwick), R. M. Garnett (Thornton-le-Dale), Mrs. Head (Burniston), F. Hewson, F.R.E.S. (Shipley), J. Hooper (Wakefield), S. M. Jackson (Selby), D. M. Jesper (Harrogate), J. H. Lumb (Halifax), R. Procter (Leeds), H. Spencer (Elland), G. B. Walsh, B.Sc., with M. Ellison and E. Owston (Scarborough), and W. E. L. Wattam (Newsome, Huddersfield).

Nomenclature has been modified to conform to the *Check List of British Insects*, Kloet and Hincks (1945), which will be used for all future county records.

The following are the more interesting of the records :

118. *A. pygmina* Haw. Wombwell, one at light, not common here.  
 168. *H. peltigera* Schiff. Skelmanthorpe, 28/8. Not in Porritt's list.  
 190. *A. lucerneae* L. Gaisby, Shipley, at light, uncommon here, 18/8.  
 248. *C. gilvago* Schiff. New to Elland area.  
 346. *C. pisi* L. Feeding on Potato and Ivy at Wombwell, and Buttercup and Broom at Harrogate.  
 671. *B. betularia* L. v. *doubledayaria*. Mating with type ♀ at Spurn in June.  
 776. *C. tullia* Mueller. Harwood Dale Moor—a new location.  
 793. *P. c-album* L. Skipwith Common, 5/10.  
 802. *P. icarus* Rott. First local record mid-August at Newsome.  
 1040. *A. bennettii* Curt. Welwick Salt Marsh, 20/6.  
 1055. *L. quercus* L. v. *olivaceo-fasciata*. ♀ emerged 16/6 from larvae from St. Ives, Bingley, larvae darker than usual.  
 1076. *P. statice* L. King Lane, Leeds, abundant, June (locality now ploughed prior to housing).



**Hymenoptera** (W. D. Hincks) : The weather conditions throughout the season of 1947 have been almost uniformly favourable for Hymenoptera. It is only to be expected, therefore, that a number of interesting additions have been made to our knowledge of the hymenopterous fauna of the county. Owing to removal from the county early in August however, the recorder's opportunities for field work have been fewer than usual.

The principle entomological event of the year was the 10-day excursion of the Union's Entomological Section to Spurn. Continuous collecting throughout the excursion yielded a wealth of interesting material and data, including many additions to the county lists. The recorder brought back more than a thousand specimens, many of which were Hymenoptera. This extensive collection is now being worked out and as it is intended to offer a full combined report for publication in *The Naturalist* at an early date, this will not be anticipated here by the inclusion of the new records so far established.

The recorder was also able to attend the Mycological Section's Fungus Foray to Masham from October 10th to 14th, after which a further week was spent in working this district. Many Hymenoptera were collected, including over 300 specimens of the neglected Fairy-flies (*Mymaridae*). Earlier in the season a visit to Askham Bog and several excursions in the Leeds district produced some additions to our County list.

The whole of the additions to our fauna will be brought forward in a separate report in *The Naturalist* at a later date.

During the year Mr. A. E. Winter published an interesting account of his observations on the 'Shirt Button cocoon' of *Dyscritulus planiceps* (*The Naturalist*, 1947, pp. 93-4, pl. 1). Subsequently he has continued his experiments in breeding this unique parasite and amongst a batch of material bred he has sent for identification the following hyperparasites: *Charips* sp. (*Cynipidae*), *Aphidencyrus aphidivorus* (Mayr.) (*Encyrtidae*), *Asaphes vulgaris* Walk. (*Pteromalidae*) and *Lygocerus carpenteri* (Curt.) (*Ceraphrontidae*). Miss M. E. Malins reports the 'Shirt Button cocoon' from Leeds in early October on Horse Chestnut, and my wife and I found it plentiful in V.C. 65 at Swinton Park and Jervaulx in mid-October.

The Rev. C. F. Tomlinson sent a fine female of the large ichneumon *Rhyssa persuasoria* (L.) taken in Bolton Woods in July, and Mr. Bayford has another taken at Darfield, V.C. 63, on June 24th.

Mr. J. M. Brown sends the following brief report on Sawflies from Robin Hood's Bay: 'I have seen comparatively few this season, and most of my records apply to the garden. *Dolerus ferrugatus* Lep. occurred among rushes on the cliffs on May 15th-16th. *Pachyprotasis rapae* (L.), several in the garden during June. *Tenthredo vespa* Retz. in larger numbers than usual and earlier, in the garden June 22nd and on *Heracleum* flowers July 3rd. *T. arcuata* Forst. was first noted on June 22nd, *T. sulphuripes* (Kriechb.) and *T. perkinsi* (Morice) on June 25th. *Urocerus gigas* (L.) was seen in the garden on July 4th. *Pteronidea ribesii* (Scop.), larvae seen on June 1st and adults on June 21st.

Mr. J. Wood has again brought together a valuable collection of Hymenoptera from the Keighley district and the recorder wishes to express his appreciation of this invaluable support.

In co-operation with Mr. H. Britten studies have continued during the year on the family *Mymaridae*, with the result that it is now possible to prepare a preliminary paper which will include several species new to science or to the British fauna.

**Diptera** (Chris. A. Cheetham) : When considering the year 1947, we must remember three possible causes for reduced numbers of any insect; the wet period of 1946, the prolonged snow covering and the drought of this summer. Only a few odd species have escaped the effects of one or other of these factors. The year has been 'disappointing' from the dipterists' viewpoint, but the reduced numbers of Tipulids (leather jacket larvae) may help agriculturalists. I do not remember a year when the troublesome species *Tipula oleracea* L. and *T. paludosa* Mg. have been so scarce. Very few of the other species reached normal numbers, though in October the autumn *T. pagana* Mg. may have done so. Two with larvae more aquatic, *T. melanoceros* Schum. and *T. luteipennis* Mg. were almost normal, but another associated with damp areas, *T. luna* Westf., which is earlier in appearing, has



been very much reduced in number. This applies to another water lover, *Prionocera turcica* Fab. (*T. diana* Mg.). I did see a few of the rare species *P. subsericornis* Ztt. The species with truly aquatic larvae, *Phalacrocer a replicata* L., was plentiful. One species of Hover fly up to normal was *Sericomyia borealis* Fln., but others, even the Drone flies (*Eristalis* spp.), have been scarce.

As will be seen in the reports of excursions, additions to the Vice-County records were made on each occasion : three to V.C. 61, nine to V.C. 62, eight to V.C. 63, two to V.C. 64 and nine to V.C. 65.

A very interesting addition to the County list is *Gastrophilus equi* F. caught by Mr. E. G. Bayford at Willow Bank, Barnsley, where he saw considerable numbers.

## FRESHWATER BIOLOGY

(H. Whitehead).—A report on the freshwater organisms taken during the Union's visit to Burton Leonard on July 19th is given in the account of that excursion and printed in *The Naturalist*.

Mr. M. Lovett (West Riding of Yorkshire Rivers Board) has sent an interesting account of some surveys made during the year and the Board's Chief Inspector Mr. J. H. Garner has given permission for this to be printed in full.

'RIVER CALDER.—Surveys of the River Calder made during the year by the West Riding Rivers Board in the region of Hebden Bridge (Eastwood to Hawks Clough) have shown that chemically and biologically the river would be suitable for stocking with coarse fish, although the comparative absence of shelter from fast-flowing flood water would render the fish liable to be carried far downstream at such times.

'Even during the warm summer months the water contained adequate dissolved oxygen. There was also ample biological material to serve as food for fish, although rooted plants were comparatively scarce.

'Growing on the surface of stones in shallow parts were the alga *Stigeoclonium*, the liverwort *Chiloscyphus*, and the moss *Fontinalis*. Associated with these were characteristic small insect larvae including those of midges, caddis flies and mayflies, and small annelid worms. Preying on these were larger larvae of stoneflies and carnivorous caddis. All of these are typical food for fish.

'Also common were the water-louse *Asellus*, the leech *Herpobdella octoculata*, flatworms and snails.

'ROCHDALE CANAL.—In June, Roach reported dying in the canal at Hawks Clough were found to be heavily infected with the fungus *Saprolegnia*. Trout and Gudgeon (less numerous than the Roach) were not affected. The fish may have been disturbed by silt washed into the canal during an exceptionally heavy storm. The Roach were spawning and massed together at the time, so that rapid spread of infection was taking place. Infection also increased as a result of the accumulation of dead fish on the surface of the water. Had these been removed as soon as possible it is probable that recovery from the epidemic would have been hastened. This is a factor that is not always appreciated.

'ASKERN LAKE.—At the request of the Askern Parish Council, an interesting experiment was made by the West Riding Rivers Board in restricting the growth of water weed in Askern Lake.

'The lake has a rich and varied growth of water plants and numerous coarse fish, but recently an excessive increase in the growth of *Vaucheria* had formed a thick mass which interfered with boating in the shallow parts. Controlled applications of copper sulphate solution were made over the shallower areas affected. The water is alkaline and this caused almost immediate precipitation of copper carbonate, thereby preventing a too rapid diffusion into other parts of the lake, and permitting a more concentrated dose than that usually prescribed for killing algae. The growth of the *Vaucheria* was greatly reduced in the treated areas, and the more delicate floating algae, *Spirogyra*, *Zygnema*, etc., disappeared. The fish were not adversely affected since they were able to move away from the treated area. Plants in the deeper part of the lake did not appear to suffer either, so that food of the fish—dragon-fly larvae, worms, etc.—was also preserved.

'Partial recovery of the *Vaucheria* and reappearance of the floating algae occurred slowly, but it was apparent that satisfactory control could be kept by application of copper sulphate at appropriate intervals, perhaps twice a year.'



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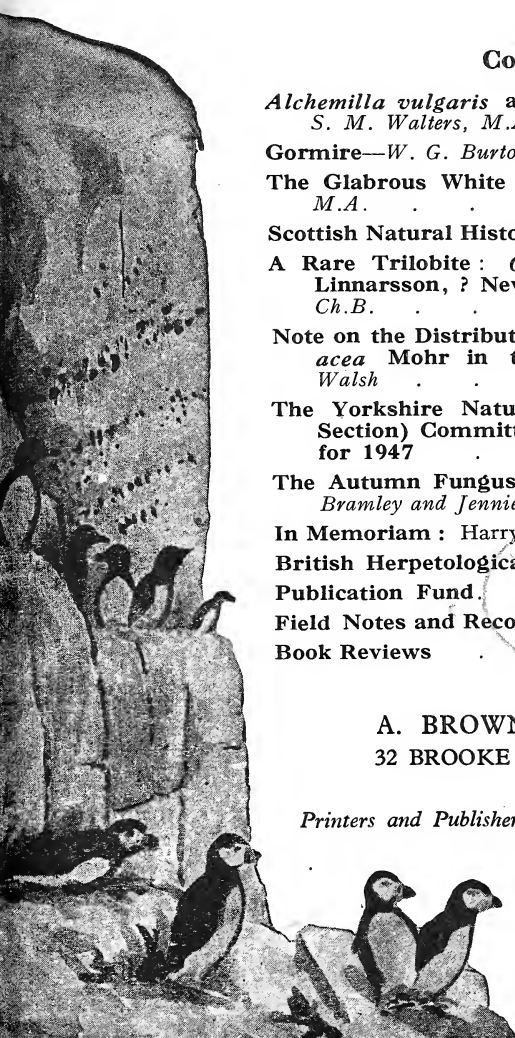
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Would all members interested in Lepidoptera please submit a list of species seen or taken in their localities during the past year? Notes upon the status of even the common species would be appreciated. Any notes should be forwarded to the Recorder :—E. DEARING, 10 Bray Road, Speke, Liverpool 19.

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### SPURN BIRD OBSERVATORY Warren Cottage Lettings for 1948

THE Committee desire to have the spring (March to late May) and the autumnal (end July to mid November) migration periods covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges will continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods of a week or longer please agree their periods with the Hon. Secretaries as early as convenient, giving if possible, alternative dates and periods? If this is done it will help those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period occupation, week-end residence, etc., can then be arranged for other helpers who should also apply early. In 1947, visits at short notice were often difficult to arrange and are likely to become more so. With five occupants the cottage is considered full.

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G. H. AINSWORTH, 144 Gillshill Road, Hull.

*Hon. Secretaries.*

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APPLY TO

The Editor of the *Naturalist*, The University, Leeds, 2

# ALCHEMILLA VULGARIS AGG. IN NORTHERN ENGLAND

S. M. WALTERS, M.A.  
Botany School, Cambridge

THE aggregate species *Alchemilla vulgaris* is divisible into a number of microspecies differing in habit, leaf-shape, hairiness, and other characters, each possessing a particular combination of these characters, a particular range of variation, and a particular distribution. The existence of these distinct microspecies is correlated with the fact that the plants are apomictic; the pollen is non-functional and usually fails to develop beyond the mother-cell stage, and in the young ovule a vegetative cell replaces the egg-cell and develops directly without fertilisation into the embryo of the seed. Reproduction by seed is therefore strictly the same as the vegetative spread of the plants, and there is no possibility of genic exchange or recombination.

There has been considerable confusion in the British records of *Alchemilla* species, due in large measure to the inaccurate determinations of Jaquet, to whom much British material was submitted. This confusion has had the unfortunate effect of discouraging taxonomic investigation of this critical group in Britain, as the general impression has been that the complexity of the group is comparable with that of *Hieracium*, *Rubus* or *Rosa*. So far as the British representatives are concerned, this is definitely not the case. The number of native British species under *Alchemilla vulgaris* agg. is in all probability quite small (of the order of 12), and most of these are readily identifiable on a number of 'good' characters. A more detailed paper on the British species has been prepared for publication elsewhere (Rep. Bot. Soc. Brit. Is. 1946, in the press); this includes a key to the species, description of *A. minima* sp. nov., and some account of distributions. The present paper is designed to stimulate interest of field workers in the North of England for this recently somewhat neglected group, and to indicate directions in which investigation would be very profitable. A simplified version of the species key is appended, which should help in field identification.

All the ten British species so far clearly recognised occur in Northern England. The habitats occupied are almost invariably more or less 'open' ones, either naturally so, or places where competition is artificially reduced, e.g. rock ledges, stream and roadsides, hay meadows and grazed pasture. The individual species show both geographical and ecological differentiation in their ranges; their total ranges may be arctic-alpine, oceanic, or continental in type, whilst minor ecological differentiation is exhibited for example in the fact that the less robust species are usually absent from hay meadows where competition from the grasses is severe. In a particularly favourable habitat however (e.g. rough grazed limestone pasture on Ingleborough) it is possible to find as many as six of the species growing intimately mixed.

*A. vestita* (*A. minor* auct., *A. pseudominor* Wilmott) is the most widely distributed species in Britain, occurring in Northern England commonly on limestone grassland, where it is often dwarfed by grazing. *A. xanthochlora* (*A. pratensis* auct.) is typically a more robust plant, common on roadsides and in meadows, and more tolerant than *vestita* of the siliceous soils of the North. Thus on the gritstone and coal-measures of the South Pennines it is the only common *Alchemilla*. *A. glabra* (*A. alpestris* auct.) is also common in the North. Over the greater part of Northern England, indeed, the common roadside *Alchemillas* are *xanthochlora* and *glabra*; and a single leaf is sufficient to distinguish the two—*xanthochlora* has spreading hairs on the petiole, *glabra* sparse appressed hairs. On limestone pasture where *vestita* occurs, dwarfed *xanthochlora* and *glabra* are commonly to be found; the completely glabrous upper surface of the *xanthochlora* leaf distinguishes it from *vestita* without difficulty.

The other seven species are rare or local, and knowledge of their distribution is very incomplete. *A. minor* (*A. hybrida* Mill.) is quite common on Ingleborough and elsewhere on the upland 'pavement' limestone. *A. filicaulis* occurs on Mickie Fell (v.c. 65) and Helvellyn (v.c. 69), and no doubt elsewhere on English mountains. *A. Wichuræ* (*A. acutidens* auct.) occurs on Ingleborough, in Teesdale, and probably elsewhere. Its European distribution is markedly arctic-alpine. The *acutidens* group of species, to which *Wichuræ* belongs, is taxonomically difficult, and cultivation experiments on forms closely related to *Wichuræ* are necessary before a satisfactory picture can be given.

A group of three species is restricted, so far as Northern England is concerned, to the Teesdale area. *A. monticola* (*A. pastoralis* Bus.) is frequent or even abundant along the roadside and in hay meadows in Upper Teesdale, at least from below Middleton to Langdon Beck. It also occurs by the roadside in the Lune Valley to the south. All other British records for *monticola* (e.g. the Ingleborough one) with the exception of two Surrey records, are based on false determinations. *A. acutiloba* occurs with *monticola* in Upper Teesdale, and is as yet only known from here in Britain, although it appears to be reasonably frequent in the area. Like *monticola*, its European distribution is strikingly continental, resembling that of the Teesdale *Viola rupestris*. The remaining Teesdale species is the arctic-alpine *A. glomerulans*, not uncommon above 2,000 feet in Scotland, which occurs in several localities at 1,000-1,500 feet in the Tees Valley. The sub-appressed silky hairiness of petiole and upper leaf-surface makes this plant easily identifiable even in the non-flowering state; and it should be looked for elsewhere in Northern England, particularly on wet rock ledges or streamsides on mountains.

The remaining species, *A. minima*, has been described from Ingleborough material. It is strikingly different from the other British species in its very dwarf habit which is completely retained on cultivation. In the field it is usually not difficult to distinguish from dwarfed forms of the other species (*vestita* resembles it most closely) by its deeply five-lobed leaves, with incisions  $\frac{1}{2}$  to  $\frac{1}{3}$  the radius of the leaf, and by its general habit of growth. Such dwarf species were described by Buser from the Alps, but none seems identical with the British. It is particularly in connection with the existence of such genetic dwarfs on the North English limestone that further field work, involving cultivation experiments, is so desirable. It is an assumption which has not yet been seriously put to the test, that the vast majority of dwarfed *Alchemillas* of upland habitats are growth-forms of the normal common species; what is required is a detailed study of a population of one or more upland habitats where there is obviously a mixture of forms, to determine how far the dwarf habit, and correlated leaf-shape characters, are genetically determined, by means of cultivation tests.

It is hoped that this short paper will stimulate interest in the group among Northern field botanists, so that some of the gaps in our present knowledge may be filled. I shall be very grateful for any information re distribution, particularly of the less common species, and also for the chance of seeing any material not readily identifiable by the key; all such information will contribute to the account of the group which I am preparing for the Biological Flora of the British Isles.

Acknowledgment is due to the Department of Scientific and Industrial Research; during the tenure of a grant from this Department much of the preparatory work for this paper has been undertaken.

#### KEY TO THE SPECIES

This simplified key may fail with badly-grown or inadequate material. It should, however, serve to identify correctly any specimens with well-developed summer radical leaves, and flowering stems.

1. Stem (at least the lower part) and petioles with spreading hairs.
  2. Whole plant, including pedicels and urceoles, hairy.
    3. Radical leaves more or less circular in outline. Plant strongly silkily hairy. *A. minor* Huds.
    - 3'. Radical leaves more or less reniform in outline. Plant usually less silkily hairy.
      4. Plant very dwarf (<5 cm. tall). Leaves 5- or incompletely 7-lobed, with deep toothless incisions between lobes. *A. minima* Walters.
      - 4'. Plant typically larger than either *minor* or *minima*. Leaves usually 7-lobed, with little or no toothless incision between lobes. *A. vestita* (Bus.) Raunk.
  - 2'. Pedicels, at least, glabrous.
    5. Upper leaf surfaces glabrous. *A. xanthochlora* Rothm.
    - 5'. Upper leaf surface hairy, at least on the folds.
      6. Radical leaves  $\pm$  circular in outline, strongly hairy on both surfaces. *A. monticola* Opiz.
      - 6'. Radical leaves  $\pm$  reniform, typically much less hairy.
        7. Radical leaf lobes markedly triangular. *A. acutiloba* Opiz.
        - 7'. Radical leaf lobes rounded. *A. filicaulis* Bus.



- 1' Stem and petioles with appressed or sub-appressed hairs, or glabrous.  
 8. Petioles, stem (except smallest inflorescence branches) and upper leaf surface  $\pm$  densely silkily sub-appressed hairy. *A. glomerulans* Buser.  
 8' Stem glabrous in upper half; upper leaf surface glabrous.  
 9. Leaf  $\pm$  circular in outline; lobes separated by distinct toothless incision, and with very acute teeth. *A. Wichurae* (Bus.) Stéf.  
 9' Leaf  $\pm$  reniform; lobes not separated by toothless incision and with  $\pm$  obtuse teeth. *A. glabra* Neyg.

## GORMIRE

W. G. BURTON, M.A., B.SC., F.L.S.

IN 1937 I spent much time on and around Gormire and sounded the tarn systematically. In view of the inevitability of change due to silting up I have thought it possible that these soundings might be of interest.

The tarn is situated about  $4\frac{1}{2}$  miles E.  $5^{\circ}$  N. of Thirsk near the foot of Whitestone Cliff, its surface being given by the Ordnance Survey as 507 feet above the mean sea level at Liverpool. Its name probably derives from the old English and dialect word 'gor' (dirt) and the old English 'myrr' (mere) (see Smith, 1928, and Brockett, 1829) although a derivation from 'gorcock' (red grouse) has been suggested (Whellan, 1859). This derivation is perhaps less likely although 'myrr' was used in conjunction with the names of birds in the thirteenth and fourteenth centuries.

Like Semerwater and the less well-known 'Devil's Hole' in Bishopdale, Gormire was said by local tradition to be bottomless 'as various parties have tried to fathom it but without success' (Whellan, 1859). Gill (1852) followed by Whellan, Mrs. Gutch (1901) and Morris (1906) quoted in support of the tradition the couplet:

'When Gormire riggs shall be covered with hay  
 The white Mare of Whitestone Cliff will bear it away.'

Gill linked the couplet to a belief in the bottomless nature of the tarn by the sentence 'Believing it to be bottomless they concluded its waters can never be dried up and the (above) quaint lines are in the mouths of the villagers.' He apparently assumed 'Gormire riggs' to refer to the bottom of the lake, an assumption contrary to any use of the word 'riggs' with which I am acquainted (see e.g. Brockett, 1829). On the other hand the Ordnance Survey gives the name Gormire Rigg to the hill which bounds the lake to the north and west (see map) and it seems probable that the couplet relates merely to the infertility of this bracken-covered slope by linking together two impossibilities. A very similar couplet is given by Grainge (1859):—

'When Hambleton Hills are covered with corn and hay,  
 The white mare of Whit'sn'cliff will lead it away.'

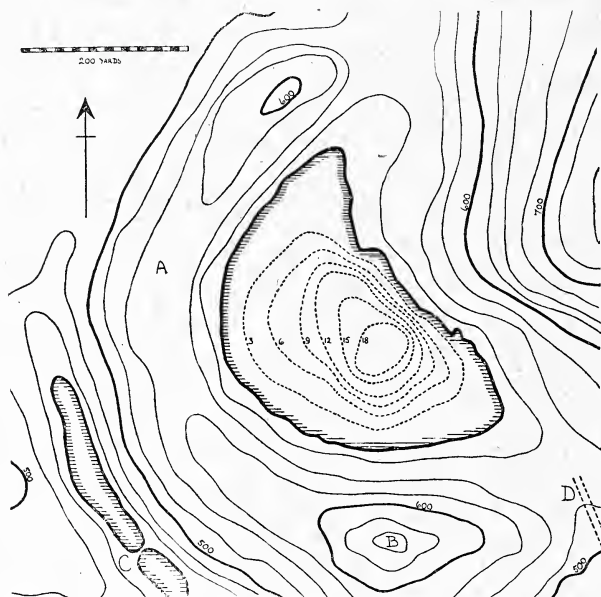
Whitestone Cliff is sometimes known as White Mare Crag. Grainge stated that this name was said to be derived from the fact that a white horse with its rider leaped down the cliff; Whellan suggested that it originated in a fancied resemblance in the face of the rock to a white horse.

Gormire shared another legend with Semerwater and with many other pools, namely that it covered the ruins of a village or town which was engulfed by some sudden catastrophe, and that the ruins of buildings were 'sometimes visible to the astonished eyes of the stranger when embarked on its mysterious surface' (Whellan, 1859). Speight (1897) supposed such legends to enshrine the memory of lake dwellings but no evidence of this origin of the Gormire legend has been discovered.

Kendall and Wroot (1924) have described the probable origin of Gormire as due to landslips in the inherently unstable structure of Whitestone Cliff—hard fissured sandstone overlying Oxford clay—closing the lower end of an overflow channel of a glacial lake held between the Vale of York ice and the Cleveland escarpments.

The greatest distance from bank to bank is about 400 yards and the area about 72,500 square yards, but both measurements are liable to vary considerably with

variations in the level of the lake as its bed shelves gradually, particularly on the west side. It is supplied by water draining from the surrounding hillsides and during wet weather in 1937 five distinct inlets were noticeable. There is an outlet, which disappears into the ground, running in the direction of Whitestone Cliff. The greatest depth recorded in 1937 was 18' 4" and the depth probably varied between about 18' and 19' depending on the rainfall. At this depth *Myriophyllum alterniflorum* DC. was plentiful and extended from about the W. 15' contour to the E. shore. Between 9' and 15' *Potamogeton crispus* L. occurred and at depths of



Map of Gormire and its immediate surroundings. The slope East of the tarn leads up to the foot of Whitestone Cliff. Land contours at 25' intervals; contours in the tarn at 3' intervals.

A—Gormire Rigg B—High Rigg  
C—Butterdale D—Lane to Rigg House and the Thirsk-Helmsley Road

6' and under on the west of the lake, *Ranunculus aquatilis* L. agg. was the most plentiful plant. In July, 1937, almost a tenth of the area of the lake was covered with *Equisetum limosum* L. concentrated mainly in the N. and S.E. corners in water up to 6' deep, from which it projected about 2' 6".

The contours of the bed of the lake as they were in 1937 are shown in the map.

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## THE GLABROUS WHITE CAMPION

N. Y. SANDWITH, M.A.

*Melandrium album* (Mill.) Garcke var. *glabrum* (De Vries) Sandwith, comb. nov. *Lychnis vespertina* Sibth. var. *glabra* De Vries, Die Mutationstheorie, i. 478 (1901). *L. vespertina glabra* De Vries in Botanisch Jaarboek, ix. 71 (1897), descr.; in Ber. Deutsch. Bot. Ges. xviii, 85, 87 (1900), nomen tantum. See also Bateson and Saunders, Rep. to Evolution Committee, Royal Society, 1, 14-15 (1902).

Vice-County 17, Surrey; waste ground, Ham Pits, one plant (♂ fls.), May 28th, 1947, N. Y. SANDWITH [3213, in Herb. Kew.]. 21, Middlesex; a number of plants on waste ground by the Thames at Chiswick, June 13th, 1942, N. Y. SANDWITH [2889, in Herb. Kew., Mus. Brit., Sandwith]; *ibid.*, Sept. 29th, 1945, N. Y. SANDWITH [3174, in Herb. Kew., Mus. Brit., Sandwith]. 32, Northants; near Kettering, 1912, G. CHESTER (Herb. Druce); 'hedgerow near Kett [Kettering?] late in the season, found last year,' comm. A. B. JACKSON (Herb. Mus. Brit.).

The above specimens differ from the typical form of the White Campion by being completely glabrous in all their parts which are shining as if varnished, and coloured with deep purple anthocyanin, especially on the stems, bracts and calyces which are also somewhat sticky owing to the presence of minute white papillae. The colour of the petals is the normal white.

I have watched the Chiswick colony for several years. The plants, which presumably are perennial, are growing among others of the typical hairy form and are very distinctive at some distance. I have collected specimens with both male and female flowers, and some plants of the September gathering bore healthy ripe fruits and greyish seeds. Some of the latter, when sown at Kew in the spring of 1947, gave rise to hairy plants with male flowers: presumably, the glabrous ♀ parent plant had been pollinated from ♂ flowers of the common hairy form. The plant collected near Kettering was mentioned by Dr. G. C. Druce in *B.E.C.*, 1912 Rep. pp. 235-236 (1913) and in *Fl. Northants*, p. 33 (1930), but Dr. Druce had apparently found no name for it. One other very closely related but not identical gathering must be noted, *viz.* specimens from 22, Berks., cultivated land near Frilford Heath, June 7th, 1923, N. Y. SANDWITH (Herb. Kew.). This material differs from the other specimens by possessing scattered hairs along the margins and midribs (on the lower surface) of the uppermost leaves and bracts, especially in their upper half, and again on some of the pedicels or near the apices of inflorescence branches, and copious hairs on the calyx teeth. Otherwise, it presents the same distinctive features.

De Vries raised his new variety from seeds of White Campion collected in the wild state near Hilversum, in 1888. Part of these seeds gave rise to completely glabrous plants. As soon as he had isolated these they proved absolutely pure (*samenrein*) and maintained their character without reversion, but after crossing with the typical hairy variety the glabrous character proved to be recessive. He presented material to the Cambridge Botanic Garden for Miss Saunders' experiments.

Although De Vries' name was validly published as a new variety of *Lychnis vespertina*, it appears to have been ignored in later standard works such as those of Ascherson and Graebner, and Hegi, who did not mention the existence of a glabrous form of the White Campion, and the proposed new combination is probably necessary. The plant was well known to geneticists such as Bateson and Miss Saunders but, although she referred to it without a name, it was not studied afresh by Dr. Doris Löve for her remarkable and important paper, 'Cytogenetic Studies on Dioecious *Melandrium*,' in *Botaniska Notiser*, 1944, Häfte 2, pp. 125-214, at the end of which (pp. 200-201) she gives a synopsis of the 'biologically and taxonomically most correct names' of *M. album* and *M. dioicum* and of the forms of the latter mentioned in her paper.

Dr. Löve treats the White and Red Campions as ssp. *album* (Mill.) D. Löve and ssp. *rubrum* (Weig.) D. Löve of the species *Melandrium dioicum* (L.) D. Löve [*sic*], on the ground that 'no barrier of sterility is observed between the two strains, and as no other differences can be found of importance as marking delimitations between different species, it is concluded that the strains should be regarded merely as two subspecies of one and the same species' (summary on p. 201). Under ssp. *rubrum* she has forma *glaberrimum* (Sekera) D. Löve and forma *lactuum* (Hartm.) D. Löve. No form is given under ssp. *album*. Dr. Löve's citations of authors,



references and dates leave something to be desired, but the entire paper is of the greatest interest to British botanists, if only for its tabulation (p. 128) of the morphological differences between *M. album* and '*M. rubrum*.'

*M. album* var. *glabrum* is the taxonomic analogue of Dr. Löve's ssp. *rubrum* forma *glaberrimum* (Sekera) D. Löve, a plant which was added to our flora long ago (*B.E.C.* 1911 Rep. p. 13) by Dr. Druce under the name *Lychnis dioica* var. *Preslii* (Sekera) and later given higher rank as *L. Preslii* Sekera in our current Plant List, although that species has been regarded as merely the glabrous variety or form of the Red Campion in standard works like those of Ascherson and Graebner, and Hegi. Our British specimens of *L. Preslii* certainly seem to be that variety, and the correct name for the purposes of our Plant List is, I think, *Melandrium dioicum* (L.) Coss. et Germ., var. *glaberrimum* (Neilreich) Schinz et Thellung. When Sekera described his *Lychnis Preslii* in 1853 he based it on his specimens which had been distributed and published as *L. diurna* Sibth., var. *glaberrima* Sekera, the name appearing as a *nomen nudum* in Maly's *Enum. Pl. Phan. Austr.* p. 310 (1848). Later, in 1861, Neilreich, in the *Nachträge* to Maly's *Enumeration* (p. 270), reduced Sekera's species to *L. diurna* Sibth., var. *glaberrima* Maly: the varietal epithet is therefore legitimate from this date, but the authorship is most suitably attributed to Neilreich. As light relief from these remarks it may be added that *Index Kewensis* gives 'Bolivia' as the country of origin of *Lychnis Preslii*, the compiler—one supposes—having misunderstood the words 'circuli olim boleslaviensis' in Sekera's description of the locality: 'Bolivia' should have been 'Bohemia.'

The glabrous character of such Red and White Campions is constant, but recessive to hairiness after crossing with hairy forms of the same or of the allied species (see De Vries, *Die Mutationstheorie*). Dr. Löve, reviewing (loc. cit. p. 131) previous work on the inheritance of hairiness in *M. album* and '*M. rubrum*,' writes: 'a glabrous mutant of *M. album* and a glabrous offspring of this plant after a cross with *M. rubrum* were used. The hybrids in  $F_1$  showed a marked dominance of the hairiness, and in  $F_2$  and back-crosses it was clearly demonstrated that the hairiness of the leaves of both *M. album* and *M. rubrum* is due to one dominant gene.' As to the constancy of the leaf surface character after intercrossing, Bateson and Saunders wrote, 'The discontinuity between the hairy and the glabrous forms appears to be absolute; among the whole number of plants raised, not a single intermediate was observed.' My Frilford plant of White Campion mentioned earlier on in this note must be considered in the light of these papers, and so must Dr. Druce's *Lychnis Troweriae*, which he described as a natural hybrid of *L. dioica* and *L. Preslii* (see *B.E.C.* 1923 Rep. p. 377) occurring in his garden, the stems being 'quite as hairy as those of *dioica*, but the leaves are more shining than those of the putative parent.'

Their constant (single gene?) heritable character, especially as it is phenotypically so conspicuous, entitles these glabrous Campions to the rank of variety for the purposes of our British Plant List, although their true biological status may well have been more accurately expressed by Dr. Löve.

*Cynodontium Bruntoni* B. & S.—Recently I found a small tuft of this moss in full fruit on a stone in the roadside wall between Austwick and Crummack Farm. We have a fair quantity of the barren plant where the sandy slates are in a vertical position especially just south of Crummack Farm at 800 ft. O.D. but I had never seen it with any fruit.

In the *West Riding Flora* Lees says the plant was first gathered by W. Brunton at Hackfall, and Bruch and Schimper named it after the finder. The Todmorden bryologists next recorded it: J. Nowell from rocks near the Strid in Bolton Woods and A. Stansfield from Rag Scouts near Todmorden. Ll. J. Cocks gave it as growing in rock crevices on Brimham Rocks in the Circular for that excursion. In 1915 it was recorded from Crummackdale.

It is a difficult plant to find being very close in appearance to the widespread *Dicranoweisia cirrata* Lindb. which is frequent on trees and gritstone walls always growing out flat and spreading whilst *Cynodontium* is always in clefts of the rocks.

Under the microscope the best guide is the presence of small teeth widely separated on the upper half of the somewhat papillose leaves of *Cynodontium*.

—CHRIS. A. CHEETHAM.



## SCOTTISH NATURAL HISTORY

W. A. SLEDGE

THERE is an irresistible attraction about Scotland. The Highlands and Islands especially cast a spell over all who love wild and beautiful country, whether artist, climber, sportsman or naturalist. Against a background of superb scenery the naturalist may here study a flora and fauna rich in variety and interest, and offering an almost inexhaustible field for study. It has been Dr. Darling's aim<sup>1</sup> to describe the animal and plant life of this remarkable region; their relations to one another and to the physical environment, and the changes wrought by time and human interference. No one better qualified for the task could have been chosen, for Dr. Darling brings to his survey an intimate knowledge based on many years of study. His home as well as his work is in the region he describes, and readers of his other books will know how closely his work is linked not only with the natural history of the area, but with the economic problems affecting its population of crofters and highlanders.

There are areas in the Highlands where a hundred square miles of country contain no human habitation; but the semblance of a wild nature unmodified by man is an illusion. Only the summits of the hills, the corries and the sea cliffs are unchanged. The rest has been stripped of its ancient forest cover to be replaced by the deer forests, grouse moors and sheep farms of to-day. Only small and ever-decreasing fragments of the original pine, birch and oak woods remain. With the virtual disappearance of the forests have gone many of the larger mammals and some birds, whilst the ranges of others have been greatly contracted. These changes and the present floras and faunas of the moorlands and surviving woodlands are described and analysed: and here as in the accounts of the freshwater lochs, rivers and sea coast, of the plant and animal life of the mountain summits and the Hebridean islands, causes, interactions and consequences give added interest to the plain facts.

Dr. Darling is a naturalist of unusually wide interests, but there is a limit to what one man can encompass. The life histories and habits of the Red Deer and Atlantic Grey Seal are two fields of research specially associated with his name and to these separate chapters are devoted. For the rest, ornithology and plant ecology are the principal subjects for discussion. He writes with an intimate knowledge of the bird life of the high summits and the glens, the sea cliffs and the remoter islands of the Hebrides with their huge colonies of sea birds; an area unsurpassed in the British Isles or indeed in Western Europe in its ornithological interest. His fund of first-hand information includes the Dotterel, Snow Bunting and Greenshank, the Crested-Tit and Scottish Crossbill, and Leach's Fork-tailed Petrel, as well as the commoner species of the mountains and coastal cliffs. The fine photographs by Eric Hosking and John Markham add still further to the wealth of interest provided for the ornithologist.

The botany of the area covers many different types of vegetation. The greater part of the Highlands and much of the Islands are covered by grassy and sedgy moors or by Heather and Bilberry on some of the better drained peats. Remains of the aboriginal Pine forests are best seen at Rothiemurchus and the Black Wood of Rannoch, but Birch is by far the commonest tree in the surviving woodlands. The floras of these habitats, of the summits of the higher mountains and of the calcareous grasslands of the Hebridean machairs are described in relation to climate, soil and biotic factors, and the supremely important influence of grazing by sheep and deer on forest regeneration is a frequently recurring theme. There are, however, in the botanical part of the book occasional references to plants which suggest that the author is not always familiar with the species to which he refers. Thus *Saxifraga cernua*, which is limited to the summit of Ben Lawers, is referred to as one of the 'fairly common' saxifrages of the mountain tops. On the same page *Carex capillaris* is said to be one of the two common alpine sedges, but this only applies to the richer hills. It is absent from great areas of the gneiss, Torridonian sandstone and quartzite hills of the west and north-west. *Aira alpina* is certainly not one of the common alpine grasses to be ranked with *Nardus* and *Festuca ovina* as a typical constituent of high moors, nor is

<sup>1</sup> *Natural History in the Highlands and Islands* by F. Fraser Darling. New Naturalist Series, Vol. 8. Pp. 303, with 46 colour photographs, 55 monochrome photographs and 24 maps and diagrams. Collins, 16/-.

*Atriplex portulacoides* one of the first plants to stabilise sand dunes along with Marram grass; and the Alpine Hawkweed which flourished on the sea cliff of Tanera, if not *H. Pilosella* was surely no relation of *H. alpinum*. *Pinguicula alpina* is referred to as occurring 'on the high tops of Sutherland and Ross,' yet despite its specific name it is, or was, with us a lowland plant. Its Ross-shire station was in the Black Isle of Cromarty at less than 500 ft. and its only known Sutherland locality was also described as 'near the sea at no great elevation.' The evidence for its former occurrence in Skye is inconclusive. The pygmy rush (*Juncus pygmaeus*) which along with the moss *Myurium* is said to 'turn up in fair numbers' on the shores of the south-west is, in fact, excessively rare, and south of Skye *Myurium* is known only in one locality on the mainland, in Tiree and on the Isle of Rum. This island is referred to as being a closed book to naturalists, but this applies only in the sense that access to the island is difficult. Professor Heslop Harrison and his co-workers have published several papers including a complete flora of the island to which, and to his more general deductions on the plant geography of the Hebrides, reference should have been made. In the chapter on the summits of the hills the impression is conveyed that all the plants mentioned are to be met with on the summit plateau. There is no mention of the corries, yet many of the species enumerated belong essentially to this habitat and not to the summits, while such an exclusively summit-plateau species as *Luzula arcuata* finds no mention.

I may perhaps lay myself open to a charge of unfairness for devoting a disproportionate amount of space to a few errors scattered through a book which contains a generous measure of sound natural history. They do not affect the picture as a whole, at the same time facts relative to distributions and identifications are so basic to natural history that one does not expect to find in a series of such high standard any errors of this kind, especially when the editors expressly claim to have taken every care to ensure the scientific accuracy of factual statements.

The fine series of photographs including many of Dr. Darling's own taking, are well reproduced, though something has gone so radically wrong with the colours of the moss carpet depicted in plate 22a that this should have been rejected. Apparently some late rearrangement of the plates was made for, with two exceptions, all the references to colour plates between pages 135-161 are incorrectly given in the text. There are a few misprints: *Eurhynchium myosuroides* for *E. myosuroides*, *Myurium hebridorum* for *M. hebridarum* and *Pressia* for *Preissia* are repeated in text and index; *Juncus bufonius* appears as *J. bufonis*, *Scilla* as *Scylla*, and the botanist's name quoted in text and bibliography as Bennet should read Bennett.

But to draw attention to occasional lapses is not to decry the book. It is a splendid story of a splendid region, and Dr. Darling has no cause to feel that sense of brooding disappointment to which he confesses in the epilogue. On the contrary, he has succeeded in giving to his account something both of his zest for natural history and his love of the country he describes. He writes not with the objective and impersonal detachment of an academic biologist, but with feeling and with an infectious enthusiasm. The naturalist from across the Border whose chances of roaming the Highlands and Islands are limited to a brief two or three weeks' holiday cannot read this book without longing for the return of summer days and the opportunity of once more revisiting the hills and isles of Scotland.

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***Gyrodon lividus* (Bull.) Sacc.**—In 'Notes on the Boleti' (*The Naturalist*, July-September, 1946) it was stated that though *Gyrodon lividus* was included among the British species on the assumption that it had been recorded as *G. sistotrema*, its existence in Britain was not fully authenticated. Since then I have received specimens from Mr. E. J. H. Corner who gathered *G. lividus* late in September, 1946, at Whittlesford, Cambridgeshire, under alders, the usual habitat of this species. The spores were light brown under the microscope, elliptical without apiculus, 1 guttulate,  $5.6 \times 3\frac{1}{2}$ –4  $\mu$ .

It is satisfactory to have an authentic record. *G. lividus* may not be so rare as we thought. Mr. Corner went to the right habitat at the right time to look for it and found it.—A. A. PEARSON.

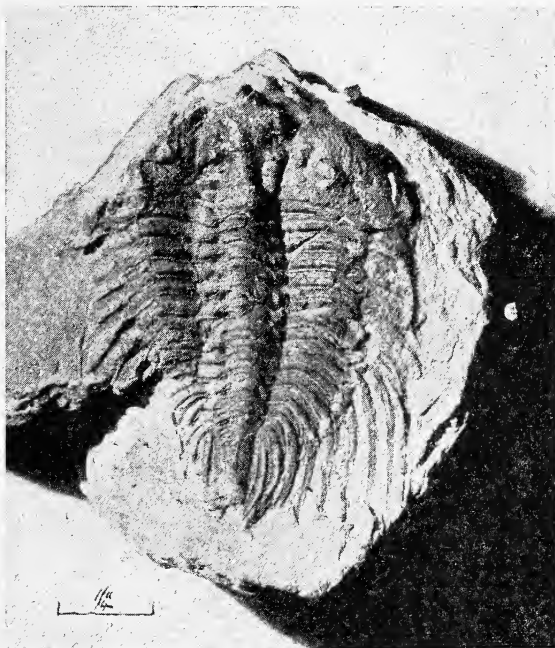
A RARE TRILOBITE: *CYBELE (CYBELOIDES) LOVENI*  
LINNARSSON, ? NEW VARIETY

T. LOVETT, M.B., CH.B.

THIS trilobite was found in the Ashgillian beds of the Ordovician rocks at Nappa Scars in Crummock valley near Austwick. At this point, the thick beds of the basement conglomerate of the Carboniferous Limestone lie unconformably on the upturned edges of the older rocks.

The specimen was submitted to Dr. Alan Wood, Professor of Geology in the University of Aberystwyth and recently Reader in Palaeontology in the University of London, who identified it as above and writes :—

'The specimen is a very rare species and not quite like anything found before.



*Cybele (Cybeloides) loveni* Linnarsson, var.

It differs from the type figure of *C. loveni* (which is however probably idealised): in having more tubercles on the pleural regions of the thoracic segments, in possessing an indentation close to the sides of the axial segments of the thorax, and in the glabellae being parallel sided instead of expanding slightly forward.

'In these two latter features it resembles the variety *girvanensis*, of Reed, from which it differs in being only two-thirds the size, and in having five or six tubercles on the pleural regions of the thoracic segments instead of two or three.

'Owing to the rarity of the species it is not possible to say what significance these differences have and the formal erection of a new variety is not advisable.'

The specimen is in the collection of the Geological Survey and Museum, Exhibition Road, South Kensington, London, S.W.7, registered number 75097.



# NOTE ON THE DISTRIBUTION OF *SCHISTOSTEGA OSMUNDACEA* MOHR IN THE PARISH OF HALIFAX

H. WALSH

THIS moss, commonly called The Luminous or Cavern Moss, due to the peculiar reflection of light from the green cells of the protonema, which in the dark recesses of caves remains more persistent than moss protonemata generally, has, since 1940, been recorded in positions that give a clearer view of its distribution in the Halifax Parish.

In *The Flora of the Parish of Halifax* (W. B. Crump and C. Crossland, 1904), the records are :

1854. Greens Clough. J. Nowell.

1888. Head of Hebden Valley. A. Stansfield.

Mr. C. Crossland commenting on these records states : ' This moss growing as it does in clefts and holes among sandstone rocks, is very difficult to find.'

In his own copy of the *Flora* with entries up to 1915, the only further comment is copied from a letter written by J. Nowell to R. Leyland in 1840 : ' It grows in narrow clefts near the top of T. Scout, but only in small quantity.'

In the *Flora of Todmorden* (A. Stansfield and J. Nowell, 1911), the records are :

(Dulesgate), (Greens Clough) (Thievley Scout), Hebden Valley, Stiperden Clough now very rare.

At least three of these, in brackets, are on the Lancashire side of the County boundary and not in the Parish. There is one packet, dated 1840, Ex Herb. Leyland, Thievley Scout, in Mr. C. Crossland's collection of mosses in the Belle Vue Museum, Halifax.

Present interest in the moss can be said to date from about 1935 when it was seen by Mr. W. Uttley in a ' cave ' in Colden Valley, near Hebden Bridge. I was shown this in 1941 and with the assistance of members of the Hebden Bridge Scientific Society and Ovenden Naturalists' Society, the following records have been compiled :

Hebden Valley, including High Greenwood, Blakedean, Alcomden and Greaves Clough.

Colden Valley, Heptonstall.

Jumble Hole, Clough and Staups Moor, Eastwood.

Upper Ryburne Valley, Rishworth.

West Vale.

In the portion of the Hebden Valley known as High Greenwood there is an outcrop of grit rocks that provides many suitable habitats, both in the wood, the rocks known as Hell Hole and also in rock near the road to Colne. It is present in so many places in this area that it can be described as plentiful. Its presence cannot be determined solely by the luminous effect of the protonema, for there are many places, generally near the mouths of clefts and crevices where the leafy plant is present without luminosity and in these positions bearing many capsules. The positions within the ' cave ' or cleft where the protonema extends among the loose sandy debris, binding it together and emitting the peculiar greenish lustre are numerous. We do not see it anywhere else in such quantity, but in the nearby Colden Valley the Out Hey outcrop provides a few suitable positions and it is present in outcrops near the road to the village of Colden.

A little to the west in Jumble Hole or Staups Valley it is present in two separate rock outcrops and on the adjoining Staups Moor.

A small amount was seen in a rock crevice near a stream in the Upper Ryburne Valley above Baitings Bridge.

The most unexpected position is on the main road leading from West Vale to Elland ; the road is bordered by an outcrop of rock and in a narrow moist recess sufficient luminosity is present to catch the eye.



## THE YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) COMMITTEE FOR ORNITHOLOGY

*Chairman* : R. M. GARNETT

*Recorders* :

North Riding : R. M. Garnett, Thornton-le-Dale.

East Riding : G. H. Ainsworth and J. Lord, M.Sc., 144 Gillshill Road, Hull.

West Riding : R. Chislett, M.B.O.U., Brookside, Masham, Nr. Ripon.

York District : E. W. Taylor, M.B.O.U., 11 The Avenue, York.

*Hon. Secretary and Editor of Records* :

Ralph Chislett.

### Report for 1947.

THE interim report published in *The Naturalist* for January-March outlined the year's activities. It remains to fill in the details so that they may be available for future study.

First let me say how glad we all are to have that distinguished ornithologist, Mr. W. B. Alexander, M.A., in the Presidential Chair of the Union ; how much we appreciate his acceptance ; and with what pleasure we look forward to meeting him during the year, and to his Presidential Address in December.

At our meetings during the past year, entertainment and instruction of a very high order were provided by our members : in March by G. K. Yeates with a magnificent set of slides illustrative of 'Bird life in Sutherland and Shetland,' followed by Lord Alanbrooke's film of the Hobby obtained for us by G. R. Edwards ; in October by W. E. Higham with films in colour of many birds, followed by C. F. Procter on 'Some Reminiscences of a Naturalist Sportsman.' Any who do not get notices by post of our meetings should notify the Hon. Secretary of the Vertebrate Section, Mr. Rex Procter, of North Gate, Linton-on-Wharfe, Wetherby, who will be glad to add their names to his list.

### The Weather.

The effects on birds of the abnormal weather in both winter and summer make a brief summary of the facts necessary. January was normal, with mild periods between periods of frost and snow which drifted deeply in the Wolds and Pennines. Aconites were in bloom at Masham on January 16th. The month ended with more severity ; and snowfalls continued throughout February with easterly winds ; some falls continuing for days, with severe frosts during the whole period, until a cold thaw began on March 15th-16th. Main roads and railways were blocked in places for weeks. Large numbers of sheep died on the hills. Villages were cut off from the outside world. For nearly six weeks it was impossible to walk or motor except along roads that had been snow-ploughed. On March 15th Leeds had its 53rd consecutive night of frost, but the thick blanket of snow prevented the frost from getting into the ground, which may have made feeding for some birds less difficult than in 1940-41, when mortality was probably higher with some species. Seed-bearing plants were deeply buried. Most reservoirs were frozen until late March, but at Swillington Ing the branch current of the Aire helped to keep some water open on the large sheet only, where great gatherings of gulls and other species roosted nightly. A comparison with the long frost of 1895 covering the same period was inevitable for those who remembered it, but in 1947 the weight of snow was much greater. The secretary of the Royal Meteorological Society wrote that for sustained severity over Britain from late January to mid-March the year does not appear to have been rivalled since 1814. After a thaw for the latter part of March, winter had a final fling in North Yorkshire with six inches of snow on April 8th.

Ice floes off the East Coast and in the Humber, and the low temperatures to which the sea fell, resulted in destruction to marine life, and to birds that feed on such (see G. H. Ainsworth and J. Lord in *The Naturalist* for April-June, 1947, pp. 57-58). Miss E. Crackles found 96 birds lying dead at Hornsea Mere and on the coast near Hornsea and Bridlington, on several dates from February 15th to April 3rd, covering Gannet 9, Guillemot 26, Common Gull 21, Herring Gull 4, Puffin 4, Lapwing 4, Common Scoter 4, Razorbill 7, Coot 9, and Cormorant, Kittiwake, Fulmar, Great Crested Grebe, Black-throated and Red-throated Diver, Tufted Duck and Black-headed Gull. Of several dozen gulls sent to G. H. Ainsworth some recovered when warmed and fed.

Great floods followed the thaw, with burst river banks, and many square miles of land under water from the Aire and Ouse and Don, which did not drain until the late spring. The summer was dry, particularly the latter half, so dry that reservoirs, after overflowing for long after the thaw, reached their lowest levels for years in the autumn, and even potatoes made poor growth and the landscape in the East Riding became brown from the effects of the drought on the grasses. Late autumn was merging into winter before enough rain fell to relieve the situation; but that fine summer was very welcome to most humans.

Meteorologically 1947 was a memorable year, the effects of which on bird life are briefly summarised under the headings of the species principally concerned.

#### THE SPURN BIRD OBSERVATORY SUB-COMMITTEE.

R. Chislett (Chairman), R. M. Garnett (Representative to Bird Observatories Committee), C. E. A. Burnham, J. Lord (Hon. Treasurer), G. H. Ainsworth (Hon. Secretary).

From February 1st to November 15th the daily log-book and the 'roll call' of species were entered up on 140 days by more than 30 people, with a considerable number of assistants, who had passed days, weeks and longer periods observing birds south of Kilnsea to the point, and manning the ringing-trap. The period of the spring passage, from April 4th to May 28th, had 16 vacant days. The autumn passage was covered more continuously, with only six days vacant between August 2nd and November 5th. In no year before has so complete a picture of migration at Spurn been made available for study; and the material is valuable now and for the future. Many items from the records will be found under the heads of species in the classified list.

Our year's records have been compared by Mr. John Buxton with the records of the Isle of May Observatory. Regarding the Blackbird, after noting that the species appeared at May in numbers from October 22nd to 28th, with a slight falling off in the last two days, and that at Spurn Blackbirds began to appear in numbers from October 18th, with maximum numbers on the 27th and 28th, he says: 'Does this mean that some of the Isle of May birds were spreading south along the east coast? Or were yours new arrivals from a more southerly taking-off place? That is the sort of question that future observations might answer. This year we can only ask them; but I think that is something.' Robins, too, were in large numbers at May from October 23rd to 28th; at Spurn the large-scale immigration took place from October 26th to 31st, with a similar feature of a few days later appearance at Spurn than at May. More data must be amassed, and many more birds be ringed, before light can be expected on the intricate problems which migration presents in respect of a large number of species.

During the ringing year to October 31st, 640 birds were ringed covering 45 species. The increase in numbers is due in part to trap improvements, but mainly to the efforts of ringers in manning the trap more continuously. Three people gave time on several visits in total equal to a month or longer (R.C., G.H.A., G.R.E.). Others worked for periods continuously or in total equal to a week or longer (R.M.G., C.E.A.B., R.F.D., H.G.B., W.F.F., H.W., J.A.C., F.M.G., E.W.L., and J.D.G., E.H., P.A.H., P.E., L.B., H.O.B., E.C., J.R.W., and Dr. Radford and Miss King). Many more gave odd days and week-ends.

Birds ringed were:—Blackbird, 90; Whitethroat, 64; Robin, 60; House Sparrow, 49; Greenfinch, 45; Chaffinch, 39; Redstart, 26; Pied Flycatcher, 25; Linnet, 24; Swallow (local birds), 21; Hedge Sparrow, 19; Willow Warbler, 19; Song-thrush, 16; Yellow Bunting, 12; Reed Bunting, 12; Ringed Plover (local nestlings), 12; Garden Warbler, 11; Sedge Warbler, 10; Brambling, 7; Great Tit, 7; Chiffchaff, 6; Starling, 6; Goldfinch, 5; Blue-Tit, 5; Wren, 5; Sand-Martin (local birds), 5; Spotted Flycatcher, 5; Cuckoo, 4; Redwing, 4; Meadow-Pipit, 3; Black Redstart, 3; Red-breasted Flycatcher, 3; Lesser Whitethroat, 3; Wheatear, 2; Goldcrest, 2; Sparrowhawk, 2; and one each of Bullfinch, Lesser Redpoll, Corn Bunting, Tree Sparrow, Icterine Warbler, Blackcap, Wryneck, Tree-Pipit, Little Tern (local nestling).

Birds retrapped include Robins and Redstarts that had been ringed a day or two earlier and were staying temporarily; Hedge-Sparrows and Great Tits that had been ringed some weeks previously and appeared to be temporary residents; a Greenfinch ringed in autumn and recaptured in February; Whitethroats and Blackbirds ringed in spring and caught again in autumn; with occasional other species

in circumstances which, like the foregoing, will provide useful data later. The Blackbird, Song-Thrush and Robin recovered at a distance; and the Cuckoo that had got to Genoa, are referred to in the classified notes.

The Observatory has succeeded financially, and funds in hand enable us to improve both the trap and amenities for our visitors. The fact that nearly all our visitors of 1946, some from far outside Yorkshire, booked again in 1947 tells its own story; and of course there is no doubt of the value of the peninsula to ornithologists. Letters from entomologists and botanists whom we have accommodated speak of the real value of the place to them. Many have expressed their appreciation by gifts of different useful kinds, to whom our thanks are due. *British Birds* from 1943 presented by Miss I. King of Oxford, requires the numbers for February and June, 1943, and for December, 1946, to complete the sets if anyone has them to spare. Sets of *The Naturalist*, 1876 to 1883, 1898 to 1930, and odd parts of 1935 to 1938, 1940 and 1945, presented by the widow of the late Fred Lawton need the blanks filling and help with binding would be welcome. Such gifts are useful in the cottage on wet days, and will be doubly so when we have bookings in winter, a season when the saltings hold much that is of interest. Our work at Spurn is only beginning. The cottage roof has been renewed and other repairs are being effected. We are grateful for the sympathetic interest in our activities shown by the Northern Command Lands Branch at York, and by the Garrison Engineer, Mr. Batchelor and his Clerk of Works, Mr. Iveson.

A word may here be useful to those who contemplate a day or two at Spurn this year and who are unfamiliar with procedure and with the notices posted in the cottage and hut. Life at the cottage is fairly strenuous if the occupants conscientiously try to fulfil its purpose. Success at the trap varies much with wind and weather. Generally the best drives of the day are those before breakfast and the first afterwards. With a favourable (N.E.) wind in the migration season, birds may continue to come into the bushes at any time. If otherwise the middle of the day is often most profitably spent checking what birds are down the peninsula and on the saltings—a matter in which visitors can usually give more valuable help than at the trap, if the ringer-in-charge already has the help he needs. Three people who take it seriously are enough for working the trap; more may merely cause unnecessary panic to the birds.

Please remember that the trap is under the control of the ringer-in-charge, who will usually, but not always be staying at the cottage; and before visiting the trap be courteous enough to call and to ask if such will be convenient. Ringed birds are mainly such as have voluntarily come into the shelter of our bank. Naturally they are most likely to come when no one is in sight. People who visit the trap unexpectedly or who stand about, singly or in groups, may cause birds that might come down to pass over, and are hindering work, to do which the ringer-in-charge has given up his time and is paying his share of the cottage rent. He can usually arrange to show the trap at a convenient time and when things are slack is generally ready to go along with the less experienced and help them to learn to identify the waders and other species. There is always room for more observers down the peninsula, and if people before leaving would set down on paper a short report of the birds seen, their estimated numbers, where and when seen, directions of flight, and other actions of interest, and would leave it at the cottage with their names, for use when the day's entries come to be made in the books each night, they would help considerably. Even continuous observation by a team, with venues planned, cannot record more than a little of the birds that come, rest, and pass.

#### THE HIGH ROYD TRAP OF THE HALIFAX ZOOLOGICAL GROUP.

In the first year 325 birds have been ringed covering 27 species:—Willow-Warbler, 58; Blue-Tit, 38; Pied Wagtail, 38; Yellow Wagtail, 36; Meadow-Pipit, 27; Robin, 22; Great Tit, 21; Tree Sparrow, 14; Common Sandpiper, 12; Hedge-Sparrow, 10; Blackbird, 8; White Wagtail, 6; Chaffinch, 6; White-throat, 5; Moorhen, 5; Lapwing (young bred locally), 4; Song-Thrush, 3; Greenfinch, 2; Wren, 2; and one each of Reed-Bunting, Swallow, House-Sparrow, Sedge-Warbler, Grey Wagtail, Magpie, Black-headed Gull and Green Sandpiper.

The site is a sewage farm beside the Calder: and the birds mainly such as could be expected to move in spring and autumn up and down the valley near to the river—the White Wagtails and the Green Sandpiper excepted, cross-country



passage migrants, and the latter the first of its species to be ringed in Britain. It is an excellent beginning. If the yearly survey of birds in the area did not suffer the Group (G. R. Edwards, V. S. Crapnell, E. W. Watson, L. Broome and H. Schofield) are to be congratulated. Recoveries of ringed birds are few and slow everywhere; and such work is no substitute for the individual training given by sustained observation and for the results that accrue therefrom.

#### BIRD BOXES IN THE FORESTS OF N. E. YORKSHIRE.

The foresters again had the advantage of our Chairman's help in this work. For the first time summer visitors outnumbered as occupants the resident Tits, many of which did not return from the villages and other places to which the hard weather had driven them until after the arrival of the Pied Flycatchers and no doubt some died. The erection of new boxes was also delayed by the weather and many remained empty.

Of the 86 boxes in which results were observed, 38.4% were occupied, or 8% less than last year—14% were occupied by Tits, 22% by Pied Flycatchers, 2.4% by Redstarts. Boxes amongst conifers remained unpopular but birds using boxes in hardwood areas possibly collected some of their food in adjoining coniferous plantations. With the help of Mr. Mackenzie of Balbeggie, young birds reared in boxes with detachable tops (as the later ones have) were marked with yellow rings to the number of 9 Great Tits, 31 Blue-Tits, and 35 Pied Flycatchers. The location of any of these in 1948 will be interesting.

The number of contributors to this report continues to grow. New names and initials appear in it each year and usually continue. That residence in a manufacturing district, and very limited time, need not prevent valuable contributions to our records has been shown by A. G. Parsons very thoroughly. News of his removal in December permanently to Truro, Cornwall, was received with much regret. The loss, too, of J. H. Barrett to the Dale Fort Field-study Centre, Pembrokeshire, will be felt severely in the East Riding and of W. S. Medlicott in the North Riding. Our good wishes go with all of them, in the full knowledge that our loss will be others' gain. It only remains for me to thank all who have contributed to the Report, which would be impossible to produce without the generous help of my colleagues, and of a host of contributors:—G. H. Ainsworth, D. Ainsworth, W. B. Alexander, F. R. Allison, P. Baldwin, L. Balmforth, J. H. Barrett, A. Baldrige, Miss J. E. Bartle, Miss S. Barras-Smith, M. Barras-Smith, J. E. Beckerlegge, W. Bennett, Lord Bolton, W. G. Bramley, Bradford N.S., R. Bramhill, H. G. Brownlow, H. O. Bunce, C. E. A. Burnham, E. B. Burstall, J. P. Busby, J. Buxton, L. Broome, K. Brown, R. S. P. Bates, L. Carr, R. Carrick, J. A. Chadwick, C. A. Cheetham, R. Chislett, A. L. Chislett, Miss E. Crackles, V. S. Crapnell, K. C. Crosbie, R. W. Crosland, F. Childs, B. Dale, P. E. Davis, K. Dawson, F. Dean, R. F. Dickens, P. E. Dean, A. Duncan, G. R. Edwards, P. Edwards, J. C. S. Ellis, G. A. Ewbank, W. F. Fearnley, W. Flesher, H. Foster, T. M. Fowler, B. Foggitt, C. E. Fisher, R. M. Garnett, A. Gilpin, R. F. Graham, C. Griffith, J. S. Griffith, W. Greaves, F. M. Gurteen, J. D. Gibson, P. Gravett, A. Gordon, Halifax Zoological Group, A. Haigh-Lumby, A. Hazelwood, R. Hewson, N. W. Harwood, S. Hewitt, B. Hanley, P. A. Humble, O. C. Hill, J. H. Howe, E. Holmes, E. O. Höhn, W. H. W. Inman, K. Ilderton, S. Jackson, F. Jefferson, Miss I. B. King, K. M. Lewis, Miss E. P. Leach, C. Lilleyman, J. Lord, E. W. Lomas, H. R. Lowe, C. W. Mason, H. Marjoram, V. Magee, Miss V. Maxse, Malet Lambert High School Naturalists, W. S. Medlicott, I. Morley, L. S. Moss, A. Moffatt, M. F. M. Meiklejohn, F. Murgatroyd, F. C. Nivens, E. Naylor, F. Newton, Newland High School Naturalists, C. Oakes, A. G. Parsons, C. W. G. Paulson, A. Pilkington, C. F. Procter, G. R. Pryor, M. Parish, Miss J. Ridgway, R. T. Renton, T. E. Richardson, E. M. Rutter, Dr. M. Radford, H. Spencer, B. Singleton, R. Slater, B. Speake, L. Smith, T. Smith, P. Stead, A. R. Summerfield, E. W. Taylor, A. Thompson, C. F. Tomlinson, T. R. Tyson, G. W. Temperley, R. Tottie, A. F. Taylor, J. P. Utley, D. Utley, D. C. Urquhart, J. R. Waites, H. Walker, A. B. Walker, A. G. Walker, J. Walker, E. W. Watson, H. J. Williamson, A. J. Wallis, R. Wagstaffe, Wakefield N. S., H. F. Woods, C. H. Wells, R. F. Wormald, A. Wilson, G. Wilson, J. R. Wheeler, A. Wright, G. K. Yeates, P. Young.

The numbers preceding the names of species are those employed in Witherby's *Handbook of British Birds*.



## CLASSIFIED NOTES.

1. RAVEN.—A bird flapped over the fell near Kettlewell on April 18th (J.R.) Not recorded as breeding in the County this year.

2. HOODED CROW.—Four birds moving south at Spurn on April 22nd (S.J., E.H.) were the last recorded in spring. The first recorded in autumn was also at Spurn on October 18th (F.M.G.); after which birds occurred regularly, 30 being counted on November 15th (G.H.A., A.W.), on which date 12 were seen on Roxby Moor, Cleveland (R.S.). There were about 30 on the shore at Marske on November 26th (J.P.U.). Single birds at Stainburn on December 5th (H.M.) and at Pool in Wharfedale on November 8th (M.F.M.M.) were the farthest west recorded. During the severe weather at Whitby on February 15th, a bird attacked a Herring Gull as the latter attempted to swallow food. During a brief fight the gull drove its bill into the neck of the crow and killed it, then died itself, and a horde of gulls quickly devoured both carcasses (C.E.A.B.).

3. CARRION CROW.—During the winter a flock of about 30 frequented Clifton Ings and had not broken up by early May (E.W.T.). The white bird of 1946 at Coniston Cold was shot on February 8th (R.T.). At Eshton Hall on May 11th an almost white bird was being mobbed by Lapwings (B.N.S.).

4. ROOK.—Since Holderness birds occasionally feed along the shore, migrant Rooks are not easy to distinguish at Spurn; but birds moving down the north side of the Humber and then south towards the point in company with Jackdaws on May 7th were probably foreigners (R.C.). Southward movements of the two species were also noted there on several dates in autumn. The census of Rooks in the Whitby area made by C. E. A. Burnham in 1947 showed five-sixths of the nests recorded in 1945. Around Leeds, A. Gilpin estimated the reduction at one-third. A White Rook has frequented the East Riding district of Lockington (G.H.A.).

5. JACKDAW.—See previous paragraph. A flock was estimated at 120 birds at Kilnsea Warren on December 20th (E.C.).

7. MAGPIE.—Upwards of 50 birds were present at a roost at Barkisland, near Halifax, on January 1st, 1947 (G.R.E.). About 300 Magpies roosted in a covert near Nunthorpe also used by Starlings during the severe weather of February (G.A.E.). About 200 birds were using the same roost on March 21st (O.C.H.). A bird ringed as a nestling at Kilnsea in spring of 1946 (J.L., G.H.A.) was found dead nearby in May, 1947 (J.R.W.). Reported to be still increasing in many areas.

10. CONTINENTAL JAY.—One of three birds feeding at Pallathorpe in the stackyard on March 17th was 'collected' and ascribed at the Yorkshire Museum to this typical race (*British Birds*, July, 1947).

14. STARLING.—A bird ringed at York by Bootham School on December 8th, 1945, was recovered at Korsor, Sjaelland, Denmark, in March, 1946. A bird ringed at Douglas, I.O.M., on February 16th, 1947, was recovered at Thearne (near Beverley) on June 12th, 1947. (Miss E. P. Leach in *British Birds*.) A bird ringed 40 kilos north of Viborg, Denmark, was found dead in a Kirby Moorside garden about March 8th (R.W.C.). A Starling dropped by a Little Owl at Kelleythorpe on February 19th had a wing measurement of 135-136 mm., a bill to base of skull measuring 27 mm., and a nostril-width of 8 mm., all within the measurements of *Zetlandicus*; it was adult (J.H.B.).

In February at a roost in Lower Teesdale G. A. Ewbank watched birds preening ice from their plumage; O. C. Hill, estimated this roost to contain 250,000 birds on March 21st. During the severe weather numerous Starlings died. Many were found dead in gardens and below roosts, and some amongst sheaves when threshing (F.J.). On June 1st in Hookstone Wood, Harrogate, caterpillars of the Mottled Umber Moth were exceedingly numerous on the oaks and others trees and were themselves providing food for large numbers of Starlings (A.G.W.). Breeding birds were far fewer in summer, and flocks in autumn smaller. At a roost near Stocks' Reservoir on September 7th, not less than 30,000 had been seen to enter well before dusk, and the total population may have been larger (C.O.). In the evening of July 10th several thousand birds congregated in reed-beds at North Ferriby (E.C.). Small parties came in steadily from east at Flamborough on October 19th (H.O.B.).

17. GOLDEN ORIOLE.—The following occurred all in early May. A male near Sleights on the 5th (W.S.M.) and 6th (R.M.G. and C.E.A.B.); an emaciated male that had been picked up dead near Settle on the 6th and was sent to Leeds City

Museum (C. E. Fisher) ; a male at Paull on Humber in the first week of May, fully described by Mr. Batchelor (Garrison Engineer at Spurn), which was also seen by several other people (G.H.A.).

18. **HAWFINCH.**—Nesting was proved at Bolton Abbey where a nest in a thorn had eggs on May 16th (C.F.T.) and at Swanland where F. C. Niven saw two adults and three young in his garden on September 5th. From late March onwards birds were seen in many places—Knaresborough, Roche Abbey, Buckden, Crag Woods, Snape, Bretton Park, Bramhope, Sleights, New Earswick, and in the grounds of Bolton Hall where about 20 spent December 18th stripping the remaining berries from the yews (Lord Bolton).

19. **GREENFINCH.**—A few dead birds were found amongst sheaves when threshing near York (F.J.). Three young fledged from a nest in the Vale of Mowbray on September 9th (J.P.U.). Passage birds occurred at Spurn from April 9th and in the autumn from October 15th (G.H.A.).

20. **GOLDFINCH.**—Two very brilliant birds occurred at Spurn on February 8th and 9th (G.H.A., G.R.E.) and a pair on May 8th which were duly ringed (R.C.). Suspected to have suffered badly in some areas of East Riding from the weather but was more normal in some other haunts in the breeding season, and subsequently on the thistledown.

21. **SISKIN.**—Twelve fed on alders near Masham on April 10th (R.C.) and on April 27th in Buttercrambe Woods in a restless flock of Siskins and Lesser Redpolls the latter predominated (J.L.). Three were noted at Spurn on May 8th (R.C.), and single birds on September 22nd (G.R.E.), and November 3rd (G.H.A.) but fewer occurred there than in 1946. In the Plain of York the earliest autumnal occurrence was on October 26th (J.P.U.). Other parties were seen near Bradford on February 8th and December 16th (B.N.S.) and in Wharfedale, 20 on December 7th (R.S.P.B.), with 40 on the 14th and 30 on the 28th (W.F.F.), and at Ellerburn on November 4th-15th (R.M.G.).

23. **MEALY REDPOLL.**—There were single birds at Spurn on February 2nd, 3rd and 8th (G.H.A., G.R.E., C.H.W.). Near Kelleythorpe, stackyard finches in early February daily included up to three Mealy Redpolls (J.H.B.). A small flock occurred near Helmsley on November 26th (A.G.). The species did not materialise at Spurn in autumn.

25. **LESSER REDPOLL.**—Although unaffected by the severe weather near Hull (E.C.) the species was scarce in central Yorkshire. A pair bred near Ramsgill (R.C.). A bird was ringed at Spurn on May 9th (R.C.) where four flew south on October 2nd (G.R.E., L.B., P.E.).

28/29. **TWITE.**—The species was recorded at Adlingfleet (Trentmouth), four on January 5th (H.O.B.), near Masham one on November 13th (P.Y.), and on Windsover, about eight on September 28th (R. F. Graham).

30. **LINNET.**—A nest in the Vale of Mowbray held four eggs on August 19th (J.P.U.). Flocks of 50 or more at Swillington on September 6th, 9th and 13th (F.R.A., K.D.) were seen to feed on sorrel seeds (A.G.P.).

33. **BRITISH BULLFINCH.**—Fifteen birds together in the grounds of Bronte House, Apperley Bridge, on January 22nd and eight on November 18th seem to be noteworthy records. On May 7th a pair-fed on unopened panicles of rowan flower buds (R.F.D.). In November several fed on rowan berries in Scugdale (R.C.) and near Harrogate (A.G.W.). At Spurn a hen ringed on October 25th was new to the trap as a species (R.C.).

36. **COMMON CROSSBILL.**—A party of ten at Mallyan Spout, Goathland, on December 13th fed on spruce cones and included three males (C.E.A.B., R.M.G.).

41. **CHAFFINCH.**—Singing was first heard at Knaresborough on March 2nd—a month later than the first date in most years (R.H.). At Spurn on March 28th birds that moved continuously towards the point, gained height over the sea and drifted north (J.R.W., G.H.A.). In autumn at Spurn numbers increased from September 28th.

42. **BRAMBLING.**—At Thornton Dale the beech woods held a flock of about 100 on January 9th and the last was seen on April 25th (R.M.G.). On April 10th at Fimber 20 birds under beeches were in nearly full summer plumage (J.H.B.).

During the cold spell four birds remained about a farm in Wharfedale for some weeks feeding on seeds of weeds put out for poultry (H.M.) and birds were noted on March 15th at Pallathorpe (W.G.B.) about a dozen, and near Apperley Bridge on the 16th (R.F.D.). About 100 birds visited a stackyard at Wigginton from 1st to 8th of March (F.J.).

At Spurn the earliest arrival was noted on October 2nd (G.R.E., L.B., P.E.). Bramblings and Chaffinches were amongst the large numbers of small birds crossing the North Sea on October 19th reported by Captain D. Stam (O.C.H.) and in late autumn the species occurred in a number of places.

43. CORN BUNTING.—Less plentiful in the York area than for many years (E.W.T.). A bird sang in lower Teesdale on October 13th (J.P.U.).

44. YELLOW BUNTING.—A bird between Pickering and Thornton Dale singing on January 19th—a warm, fine day—was ignoring the song-chart in the Handbook (M.F.M.M.). Flocks of Finches about farmyards near Wakefield in the cold weather included large numbers of Yellow-Hammers; one such contained about 100 (A.G.P.). Parties of birds were seen moving south at Spurn on September 26th (G.R.E., W.F.F., H.W., L.B.), possibly local movement.

50. ORTOLAN BUNTING.—A male bird at Spurn on May 9th gave close views of its cream orbital ring, green head, yellow patch on throat, warm buff breast and other points (R.C., J.R.W.). A bird seen there on April 11th was believed to be of this species (H.G.B.).

59. SNOW BUNTING.—Seen on several dates along the coast near Teesmouth and Redcar where the bird winters in flocks up to 100 birds—including March 15th and November 3rd (O.C.H., A.B., K.G.). Similar remarks with numbers rather smaller apply to the Kilnsea area with a maximum of 35 on December 20th (E.C., P.G., J.W.). H.O.B. saw a party of 40 at Flamborough on November 30th. A flock of 40 birds on Goathland Moor on December 7th ran between plants of *Juncus Squarrosus*, reaching up to take the seeds (R.M.G.), and were doing the same close by on Sleights Moor on the 13th (C.E.A.B.). Inland the species was noted in Swaledale on March 13th (J.P.U.).

62. TREE-SPARROW.—A party of four were at Spurn on May 9th (J.R.W.) and six on October 17th (F.M.G.). Four were with finches at Leathley on February 19th (M. and S.B.S.) and 15 at Walton on March 23rd, with a larger party at Bottomboat on April 10th (A.G.P.). A pair at Walton were nesting in an old woodpecker hole on May 23rd, having turned out a pair of Redstarts (J.H.). Six pairs bred at Kelleythorpe (J.H.B.).

[68. CRESTED LARK.—H. G. Brownlow, from his experience with the species in Germany, had no hesitation about this bird at Spurn on April 11th. 'It was definitely larger than a Skylark, had an obvious crest, and had the broad-shouldered, tapering to tail, angular look of the Crested Lark. I could see no white on the outer tail feathers.']

With a species that would be new to the county, and which has occurred so seldom in Britain, it is felt we should not claim a definite unsupported record, hence the brackets; but the 'glassing' of many Larks on the coast will be stimulated (R.C.).

69. WOODLARK.—On March 29th, at High Hoyland, near Barnsley, attention was drawn by an unfamiliar song in the upper branches of a poplar bordering thorn-dotted grassland outside a plantation of small conifers. The bird came to ground to be joined by another, and the short, rather squat form, the contrasted light and dark upper parts, the broad buff superciliary stripe meeting on the nape were noted. After a short time one of them recommenced singing from the wing in the lark-like fashion, and showing its short tail and comparatively broad wing. Some of the thorns were cut in the following week, the site having been requisitioned for opencast coal working, and the birds could not be found again (J. C. S. Ellis).

70. SKYLARK.—On February 4th not long after the onset of the severe weather, parties numbering about 25 birds were passing south at Spurn all day until dusk and again on the 5th at the rate of about 1,500 an hour (G.R.E.). At least 60 were in stubble at Winterset on September 13th (A.G.P.). There was a steady influx of small parties at Flamborough on October 19th (H.O.B.), the day on which Captain Stam saw large numbers of small birds crossing the North Sea.

72. SHORE LARK.—A bird was seen on Scarborough South Shore on September 28th (E. P. Evans).

[74. TAWNY PIPIT.—A Long-legged Pipit with a Wagtail-like appearance, smooth grey-brown back and pale underparts, picked about on the Humber shore near Kilnsea on October 31st and may have been of this species. It flew into the dunes before I had completed examination (R.C.).]

75. TREE-PIPIT.—The first of the year occurred in the Vale of Mowbray on April 10th (J.P.U.). Other early dates are April 13th near Hull (J.R.W.) and



April 16th near Halifax (H.Z.G.). Noted at Spurn on August 9th (R.M.G., G.H.A.) and birds were passing all day on September 19th (G.R.E., W.F.F., H.M.).

[79. WATER PIPIT.—The light eye-stripes of two Pipits on November 7th suggested this species to H. F. Woods at Bridlington where he knows the Rock Pipit well.]

76. MEADOW PIPIT.—Meadow Pipits were back on the moors near Masham before much of the snow had gone on March 20th, and an odd bird occurred on December 31st (P.Y.). There were large numbers of migrants at Swillington Ing on September 13th (F.R.A.). 27 were caught and ringed in the High Royd trap (H.Z.G.).

84. BLUE-HEADED WAGTAIL.—A bird seen on May 14th at Stanley Sand-pits near Wakefield had a crown and nape the colour of a bluebell and a white superciliary stripe; it was with a hen indistinguishable from *flavissima*. On July 17th, an abraded but unmistakable cock consorted with a party of juvenile and adult Yellow Wagtails, three-fourths of a mile away (A.G.P.).

88. YELLOW WAGTAIL.—At Bottomboat, near Wakefield, there were nine on April 17th (A.G.P.), at High Royd one on April 12th (G.R.E.). Seven cocks passing upstream along Derwent Valley Marshes on April 26th, and a party on May 2nd were the first yet noted in the Vale of Pickering by R.M.G. Evidently some stayed to breed for a pair were feeding fledged young at the same place on June 22nd and August 1st (probably a second brood), and a second pair of anxious birds was seen. Possibly strong westerly winds at the time of migration may have carried the birds further east than normal (R.M.G.). The species can be seen in numbers in Holderness in September and breeds, but was not seen to use the East Coast route to any extent. In spring only odd birds were seen at Spurn (April 9th, May 5th, 6th and 9th). From August 12th a few birds were seen, with up to six in a day more regularly between September 10th and 24th. The High Royd trap caught 36 birds of this species (H.Z.G.).

89. GREY WAGTAIL.—Much reduced in numbers in the western dales this year (R.C.).

90. PIED WAGTAIL.—During the severe weather of January-March was in evidence about sewage farms in the West Riding. On October 11th three waves of Pied Wagtails, each of about 200 birds, and several smaller ones, flew south-south-west over Swillington Ing (F.R.A., K.D.). The High Royd trap caught 38 birds (H.Z.G.).

91. WHITE WAGTAIL.—Birds were seen as follows—one near Wakefield on April 17th (A.G.P.), one at Swillington Ing on April 19th (K.D.) and 22nd (A.G.P.) and 24th (M.F.M.M.). At High Royd, near Halifax, between April 20th and May 3rd, parties numbered from 6 to 16 birds, and 6 were caught and ringed (G.R.E.). At Spurn single birds were noted on April 26th (G.H.A.) and May 5th (R.C., J.H.B.).

93. TREE CREEPER.—There was little evidence in spring of any reduction in numbers amongst the old timber around Masham, but A. Gilpin estimates that in the country around Leeds reduction reached 60 per cent.

96. NUTHATCH.—A bird in Farndale on April 16th was the first recorded there (R.W.C.). The pair in Thornton Dale reared young in the same hole as last year, and the male remained 'finger tame' from the severe weather until the young left the nest on June 24th-25th—17 days later than in 1946 (R.M.G.). In the lower ends of the western dales there was little evidence of diminution, if any, after the severe weather (R.C.).

97-98. GREAT TIT.—In November birds in Thornton-le-Dale, and Blue Tits, repeatedly took fresh putty from a newly-glazed roof (R.M.G.). More were recorded at Spurn in autumn than usual, the maximum being 12 on November 15th (G.H.A., A.W.). A bird caught at Spurn and ringed on October 29th had a small slender bill fitting exactly that of the continental bird shown in the Handbook (R.C.).

100. BLUE TIT.—Young were reared near Loftus-in-Cleveland in the old hole of a Great Spotted Woodpecker, in which there was nothing at the bottom of the hole when the young flew except chips of wood (R.S.). Small numbers occurred at Spurn in late September and early October with a maximum of six on October 3rd (G.R.E., L.B., P.E.).

108. WILLOW TIT.—Breeding is recorded at Bardsey near Wetherby (F.R.A.), and at Allertorpe Common (J.L.). Birds were also identified at Kelleythorpe, two on February 5th which remained until mid-June (J.H.B.), and two at Haltemprice



Lane, East Riding in November and December (E.C.) and at Hubberholme on October 12th, and in the Washburn Valley on October 18th and December 7th (M.F.M.M.).

111. LONG-TAILED TIT.—Diminution in numbers of Titmice following the severe weather was only noticeable with this species, which was less reduced than in 1940. A. Gilpin (Leeds) estimates the reduction at 60 per cent. which I think is generally about right (R.C.).

114. GREAT GREY SHRIKE.—On May 1st a bird was seen both morning and evening at Barton Hill (R.F.W.) and another occurred between Easington and Kilnsea on November 1st (E.C., R.C.). C.E.A.B. and R.M.G. saw one near Lockton Lane end on January 21st and 22nd.

119. RED-BACKED SHRIKE.—A cock bird showed itself at Spurn on May 5th and 6th (R.C., J.R.W.) and a juvenile on August 29th (A.L.C., R.C.). At Skipwith on May 10th a bird made short flights from a telegraph pole (B.D.). In the Blubberhouses area a male occurred on June 16th and was still there on June 28th (A. W. Bartlett).

120. WAXWING.—The invasion of 1946 lasted into 1947 with numerous reports of birds in January of which the largest numbers were in the north-east—50-60 in Eskdale on January 4th, 30 in Middlesbrough Park on January 2nd. J. Lord and G. H. Ainsworth published notes on the species in the East Riding in the July *Naturalist* and small parties and odd birds were reported in many places, the last being in G.H.A.'s garden at Hull on March 15th. Farther west, birds were seen in Teesdale, and near Northallerton, 12 on January 7th (J.P.U.), near York, two on February 11th (E.W.T.), near Ripon, two on January 26th (H.G.B.), near Fairburn, one on January 12th (M. and S.B.S.), at Menston-in-Wharfedale, nine on January 5th and some on other dates (V.H., W.F.F.), and in the same district seven piles of feathers were found on the edge of a rubbish tip the cause of which was uncertain (K.C.C., W.F.). At Weeton there were five birds on January 25th (H. C. Stembridge), and on February 24th (A.H.L.). Fruit of Cotoneaster and Siberian Crab were used by a bird in Harrogate (A.G.W.). Whether any birds got back safely to their country of origin after such a winter cannot even be surmised, but at least one survived until the thaw.

121. SPOTTED FLYCATCHER.—Arrived at normal dates with May 8th at Apperley Bridge as the first reported (R.F.D.). September 24th was the latest date reported inland, at Ilkley (R. F. Graham). A few were noted at Spurn in spring, but only one bird was recorded in autumn, on September 25th (G.R.E., W.F.F.).

123. PIED FLYCATCHER.—A bird was seen on passage at Chevet Wood near Wakefield on April 16th (J.H.) and a pair at Romalldkirk in Teesdale on the 19th (G.R.P.); average arrival dates were a few days later. At Spurn birds were passing from May 2nd to 11th, four being seen on the 5th, with the possibility that the birds had a continental destination (G.H.A., R.C.). Near Hornsea Mere a bird was seen on May 17th (C.F.P.). Many records show that breeding birds were plentiful from Wharfedale northwards in the western dales, and in woods across the upper end of the Vale of Mowbray (R.C., J.P.U., etc) and in Cleveland. Seven pairs nested in boxes in Dalby Forest where they had not been recorded previously to the introduction of the boxes (R.M.G.). R.M.G. noted two brown-headed cocks, one at Cropton again and one in Staindale, and the cock of one pair near Masham had the dark parts of its plumage brown and only a slight spot of white on the forehead (R.C.).

125. RED-BREADED FLYCATCHER.—A male in spring plumage was noted at Spurn on May 10th (G.H.A.) and three young birds were caught in the trap and ringed on September 26th. During the evening they chased each other about and called frequently; one of them was still about the huts and bushes on the 28th (G.R.E., W.F.F., L.B., H.W., J.A.C.).

126-127. GOLDCREST.—The typical remark of the year regarding this species is that of Barry Speake—'One at Eccup on January 25th, no more in the year'; it has become a rarity, and suffered more from the severe weather than any other species. No breeding record was reported but Bradford Naturalists report two at Dowley Gap on April 2nd. First noted in autumn near Kilnsea on October 18th (F.M.G.) Goldcrests became fairly numerous at Spurn from October 25th to 28th (R.C., E.C., G.H.A.) and were seen in autumn at Scarborough (A.J.W.), and one near Pickering on December 13th (M.F.M.M.). Yorkshire stock is very small indeed but passerine birds, possibly through immigration, sometimes show an amazing resilience and we shall look with interest for signs of recovery.

129-131. CHIFFCHAFF.—A bird at Bretton on March 22nd with snow still on the ground, was silent (J.C.S.E.). An odd bird occurred near Knaresborough on April 1st (K.I.). A bird called from trees near Cartwright Hall, Bradford, on September 24th (S.J.). Began to pass at Spurn on August 29th; a single bird, then not recorded again until September 19th (G.R.E., W.F.F.) three birds, after which a few occurred on several days. A bird trapped on October 28th had a white abdomen and lower breast shading to pale buff on flanks and throat and was believed to be of the Siberian or Scandinavian form, probably the former (R.C.). Single birds seen on October 31st and November 1st were very grey and may have been of the same type (R.C., E.C.).

132. WILLOW WARBLER.—The earliest record came from near Wakefield on April 4th (J.H.) with the next record a week later; the species became generally distributed by the 16th. At Spurn small numbers passed in spring from April 10th and in autumn from August 3rd to September 20th.

135. WOOD WARBLER.—First noted April 25th at Masham (R.C.). Not recorded this year at Spurn.

145. GRASSHOPPER WARBLER.—Songs were heard from suitable habitats in the Vale of Mowbray on May 10th (J.P.U.), near Bramhope on May 11th (M.F.M.M.), North Ferriby on May 11th and 14th (E.C.), near Pickering on May 18th (B.D.), and at Buttercrambe Woods (J.L.), near Gilling on May 26th (E.W.T.), near Wakefield on May 29th after which the bird was not heard there again until July 10th and 13th when reelings varied from 5 to 55 seconds in duration and two birds were seen (A.G.P.). At Redmires (Sheffield) a bird sang on July 28th and for some evenings after (C.H.W.) and a bird was seen near Masham on September 7th (P.Y.). Breeding occurred at Gilling (W.H.W.I.).

149. REED WARBLER.—At Acomb ponds a nest was found on June 8th (J.L.) and a new colony was found near Hessle where young were being fed on June 30th (E.C.). Birds were normal at known colonies visited, except that proof of breeding was lacking at Scarborough.

153. SEDGE WARBLER.—April 25th was the date of the earliest record, near Wakefield (Bottomboat) (A.G.P.) but the species did not occur at Spurn until May 4th (R.C., J.H.B.) where the last autumnal record occurred on September 25th (G.R.E., W.F.F.).

155. ICTERINE WARBLER.—A young bird was ringed at Spurn on September 4th by E.C. and was also examined by G.H.A. and D.U. The detailed description made with the bird in the hand was sent to R. Wagstaffe who confirmed the identification and loaned a skin for comparison. G.H.A. also inspected a series of skins at the British Museum shortly afterwards.

161. GARDEN WARBLER.—Early records were in the Vale of Mowbray on April 24th (J.P.U.) and near Hebden Bridge on April 30th (F.D.). Recorded in spring at Spurn from May 2nd to 8th and in autumn from August 23rd to September 19th (R.C., G.R.E., etc.).

162. BLACKCAP.—Early records were in the Bradford area on April 24th (B.N.S.) and at Buttercrambe on April 27th (J.L.). At Spurn a bird was ringed on May 4th (R.C.) and single birds were seen on August 12th (R.M.G., G.H.A.), and on September 24th (G.R.E., W.F.F.).

163. COMMON WHITETHROAT.—First recorded at Hutton (E.C.) and at Buttercrambe on April 27th (J.L.) on which date it was also first seen at Spurn (J.R.W., H.O.B., E.H.). Last seen normally at Spurn on September 23rd (G.R.E., W.F.F.) with a straggler on October 30th (R.C.).

164. LESSER WHITETHROAT.—A bird was seen near Driffield on April 19th (E.C.) and at Haxby on April 24th (F.J.). Passage migrants at Spurn occurred from May 4th to 8th, six being seen on the 6th (R.C., J.R.W.). Small numbers passed down from August 12th to 30th, and a single bird on October 3rd (G.R.E., L.B., P.E.). Generally the species was scarce; a nest with young was found on June 20th in the Cleveland area, where it is usually not very uncommon (R.S.).

173. FIELDFARE.—During the severe weather many were found dead or dying in the Sheffield area (L.C.). For some days prior to February 18th a bird fed on cotoneaster berries close to a window at Austwick (C.A.C.) and at Harrogate on the 24th (A.G.W.); on the 19th one entered a trap for food at Apperley Bridge and was ringed—it was in very poor condition (R.F.D.). O. C. Hill also records cotoneaster as food in February and whitebeam berries in November. There was a flock of about 100 at Goathland on May 5th (W.S.M.) and the last bird of spring

was seen at Spurn on May 11th (R.C., G.H.A., J.R.W.). The species was seen in the Vale of Mowbray on October 9th (J.P.U.) and on the Scarborough Moors on October 8th and several on the 11th (A.B.W.) but the main flocks were late in arrival and it was October 25th before the species was seen in the Spurn area (R.F.D., R.C., etc.), on which date ten were seen at Winterset (A.G.P.). About 500 birds were settling in to roost in trees at the top of Scugdale (J.P.U., R.C.) on November 9th and on the same date large flocks near Hebden Bridge were estimated at 700 birds (G.R.E., R.S.P.B.). The size of these as yet undispersed flocks seem to indicate the north of the county as the scene of the main immigration this year. Not seen in Thornton Dale until October 30th but numerous in Pickering Vale in December, large flocks roosting in Dalby Forest (R.M.G.).

174. MISTLE THRUSH.—This species was severely reduced by the cold weather and A. Gilpin estimated the reduction near Leeds at 50 per cent., which I should consider to be an underestimate for the Masham area, where the song was seldom heard in spring. Near Sheffield the species disappeared during the hard weather but nesting birds were not seriously affected subsequently (L.C.).

175. SONG THRUSH.—A bird ringed as adult at Huddersfield by A. N. Sykes on March 1st, 1946, was recovered in Co. Kildare on April 9th, 1947. A bird ringed at Spurn on October 15th, 1946, was recovered at South Killingholme, Lincolnshire, on February 18th, 1947—18 miles west (E.P.L. in *British Birds*). Generally a decrease in numbers this year was obvious, especially in the York district (F.J., E.W.T.) where several were picked up dead, but less so than was expected in the East Riding (G.H.A., J.R.W.), and near Masham (R.C.). Near Sheffield nesting pairs were not much affected, but during the cold period Song Thrushes disappeared (L.C.). Returned to Methley and sang on March 11th, absent all winter (P.B.). Near Wakefield J. Howe reports the species as commoner in the nesting season than in the previous two years. Very little song was heard in autumn, and from the absence of the species from early November about Masham I concluded our birds had migrated (R.C.).

178. REDWING.—Many were picked up dead near Sheffield (L. Carr) and in the grounds of the Yorks. P.S., York, during the cold weather (E.W.T.), and two starving birds were picked up near Whitby on February 7th (C.E.A.B.), where exhausted birds were also seen on the beach (A.B.W.). The last birds were seen at Hornsea on April 7th (E.C.) and near Redcar, on the tide line, on the 19th (O.C.H.).

The first birds of autumn occurred at Spurn on October 8th (A.L.C., R.C.) and near Thornton Dale on October 11th (R.M.G.). Inland birds were first noted over Knaresborough on October 18th, and large numbers passed along the valley of the Nidd in the morning of November 3rd after a night of strong south-west winds (R.H.). On October 18th birds occurred near Wakefield (A.G.P.) and near Bradford on the 19th. In late October occurrences became more general but numbers were fewer than in the previous year.

182. RING OUSEL.—The earliest records were at Gorple Moor on March 23rd (E.W.W.) on Burley Moor on the 25th (W. Flesher). Single birds on the moors near Masham on October 8th and 23rd (P.Y.) were late.

184. BLACKBIRD.—A bird ringed at Spurn on November 17th, 1945, was recovered at East Ravendale (Lincs.) on February 19th, 1947—16 miles south-west (E.P.L. in *British Birds*). A nest in which three broods were reared in the garden of J. Howe at Wakefield was not repaired between broods. This species, although often appearing very miserable, withstood the rigorous winter well and there was little apparent reduction in numbers subsequently. The main influx of autumn at Spurn took place from October 18th to 31st when some 60 birds were ringed.

186. WHEATEAR.—Early dates were March 20th near Austwick (C.A.C.), and near Goldsborough (R.H.), and near Bradford (B.N.S.) on the 21st at Rosedale Head (H.O.B.). At Spurn March 22nd was the earliest date (J.R.W., G.H.A.) and numerous birds passed in autumn from August 23rd to September 12th with fewer afterwards; the last was seen on November 2nd (R.C., H.O.B.). Passage birds occurred up to September 13th at Swillington Ing (K.D., A.G.P., F.R.A.) and at Redmires Dam, Sheffield, on September 21st (A.F.T.).

187. GREENLAND WHEATEAR.—Birds believed of this race occurred at Spurn, two on May 9th (R.C., J.R.W.) and two on August 14th (W.B.A.), and others on several dates up to September 22nd.

197. WHINCHAT.—At Spurn first noted on May 5th (R.C.), and in autumn occurred from August 9th to September 30th (G.H.A.).



198. **STONECHAT.**—As usual, records of this bird were few; a cock near Hawes on May 24th (R.B., C.G.) a bird near Ilkley on June 25th (B.N.S.), one at Kilnsea on May 4th (H.O.B.), and a male at Spurn on September 27th (G.R.E.), with juveniles on October 2nd and 4th. In the north-east a bird occurred on July 13th at Ughorpe (R.S.), and on Castle Hill, Scarborough, on November 12th (A.J.W.).

201. **REDSTART.**—At Spurn a cock bird was seen by J. Dowley on March 21st. The earliest date inland was April 14th near Masham when a cock sang (R.C.).

Birds occurring at Spurn daily from April 27th to May 8th (R.C.) suggested the possibility of passage to the continent. In autumn there were two distinct movements, one from August 23rd to September 7th during which birds were seen daily with eight as the maximum on September 4th (E.C., G.H.A.) after which no more were seen until September 19th to 27th, these also daily with eight as the maximum seen both on the 19th and 20th (G.R.E., etc.); subsequently odd birds only were seen on October 13th and 23rd (R.C., A.L.C.). The possibility of continental origin was suggested to me again by this second passage period. During the second period on September 22nd a bird was seen at North Ferriby, westward up the Humber from Spurn, the likeliest route for travel. 26 Redstarts were ringed and light may yet be cast on the problem.

202. **BLACK REDSTART.**—In spring four birds appeared at Spurn, on March 23rd (J.D.), April 4th (R.M.G., C.E.A.B.), April 12th (G.H.A., H.G.B.), and May 4th (R.C., A.L.C.). J.H.B. at Flamborough Head on March 28th saw two first-year males. In autumn F. M. Gurteen noted single birds on October 13th, 15th and 18th, and three on the 17th, and two more were seen on the 28th (R.F.D.).

207-208. **ROBIN.**—A bird at Spurn on September 14th was the first seen since May 6th. From September 19th to October 2nd a few birds occurred, then no more were seen until October 23rd, and from the 26th to November 1st (a day or two later than the peak period at the Isle of May) the species was extremely numerous, 38 being caught and ringed.

210-211. **HEDGE SPARROW.**—A bird sang at Apperley Bridge just after midnight on June 26th (R.F.D.).

213. **WREN.**—'Survived but much reduced' are the words used about this species by most recorders. Dead birds were picked up, one in a Robin's nest (L. Carr). Near Wakefield A.G.P. and J.H. did not see or hear one after the thaw until June. But in most districts a very few birds were left. Fewer occurred at Spurn than in 1946.

219. **DIPPER.**—A bird ringed by E. W. Watson on May 21st, 1946, as young was found dead and decomposed in June, 1947, near a Tawny Owl nesting site (F.D.).

220. **SWALLOW.**—One at Warton on April 7th (D.U.), one near Ilkley on April 13th (W.F.), one at Masham (R.C.), and one near Wakefield (J.H.) on the 14th with about 20 at Ripley Castle (A.G.W.) were the earliest inland records, and many were still arriving at the end of the month. At Spurn odd birds were seen on March 22nd (G.H.A., J.R.W.) and March 31st (E.C.) and a bird occurred at Keyingham on the 21st. Movements are not easy to follow and it is not very unusual to see birds passing both north and south along the Spurn peninsula on the same day, even continuously. Thus many small parties of birds passed south on April 26th and 27th (G.H.A., E.H., H.O.B.) and also during the period May 5th to 14th, with smaller numbers moving north. The southward moving birds had come down the north foreshore of the Humber; the northward bound birds from across the mouth of the estuary. Movements continued up to June 8th (H.O.B.). The numerous local breeders complicate matters. On September 1st Swallows passed both ways all morning (G.H.A., J.L.). The main autumnal movements were between August 25th and September 14th. The last bird was seen at Spurn on November 1st (E.C., R.C.), and two were at Malton on October 31st (R.M.G.).

Birds stayed late at Thornton Dale where two were seen on October 31st (R.M.G.).

For a few days from August 10th, 300-400 birds roosted in willows at Scarborough Mere (A.J.W.).

222. **HOUSE MARTIN.**—An early bird was seen at Ryhill on April 4th (J.H.) and two near Methley on March 21st (P.B.); but other records of first dates vary from April 20th to 25th on which latter date the species was first seen at Spurn, where birds were noted following the north bank of the Humber and turning south down the peninsula—May 5th-14th, May 25th, and June 8th. Last noted at Spurn in autumn on October 12th—four birds (T.M.F., R.C.). R.M.G. saw a



late bird in Forge Valley on November 17th. Nests were seen on cliffs at Staithes (O.C.H.), Flamborough Head (A.G.W.) and at Kilnsey Crag, Wharfedale (R.C.).

223. SAND MARTIN.—March 21st at Hornsea (J.R.W.). March 22nd at Wilton (N. W. Harwood), and March 23rd at Redcar (P. Stead), and near Hebden Bridge (E.W.W.) were the first records. On March 24th at Wawne Ferry a bird trying to make headway against a strong north-west wind fluttered to the ground and was picked up dead (C.F.P.). Three were at Ilkley on April 4th (L. S. Moss) and about 100 near Castleford on April 8th (A.G.P.) and birds were still reaching their habitats until late in the month. None were noted at Spurn before April 25th (E.H.), and the species was last seen there on September 28th (G.R.E.). The passage both north and south along the Spurn peninsula on the same day also occurs with Sand Martins, often accompanying Swallows as on September 1st (G.H.A., J.L.).

225. SWIFT.—Birds were seen in April near High Royd S.F., two on the 25th, one on the 26th, seven on the 27th, two on the 28th after which they disappeared (H.Z.G.), in Wensleydale on the 26th (L. Wray), at Winterset on the 27th (A.G.P.) and Ben Rhydding (B.N.S.), near Harrogate on the 25th (A.G.W.) and 29th (K.I.). But most birds did not come until May and the arrival en masse at Swillington occurred on May 9th (A.G.P.).

On July 29th several Swifts were seen to leave crannies in Kilnsey Crag where they are well known to breed (R.C.). At Spurn Swifts were not noted until May 11th (R.C., G.H.A.) and birds were passing south on June 8th (G.H.A.), with the main movement south at the end of June. Last noted there on September 16th (R.C.). None were seen at Masham from August 8th to 11th but three, possibly newcomers looking for a roosting place, flew round before dusk on the 12th (R.C.).

227. NIGHTJAR.—Birds were heard and seen in the breeding season in Wharfedale, Airedale, Wensleydale, Staindale, at Strensall, and on Eaton Moor—at least six broods of young were reared.

234. KINGFISHER.—The species was much reduced in numbers on the Ouse and the Rye (E.W.T.) and generally (R.C.). No report of the species in the East Riding was received after January 4th when one was seen at Hornsea Mere (E.C.).

235. GREEN WOODPECKER.—In some areas this bird has become very scarce since the storm, particularly in the northern parts of the county; in others there appeared to be little apparent diminution.

237. GREAT SPOTTED WOODPECKER.—Always the commonest in Yorkshire of the family, this bird withstood the winter fairly well and several occupied nest-holes were found on Y.N.U. field meetings.

238. LESSER SPOTTED WOODPECKER.—Young were reared near Bingley (B.N.S.) and near Thorner (A.G.). Harrogate (A.W.G.), Wakefield (J.H.), Bretton (J.C.S.E.), Methley (P.B.), Swillington (B.S.) and Temple Newsam, near Leeds (H.G.B.) are areas in which birds were seen.

239. WRYNECK.—A bird was found dead in a garden at Cloughton, near Scarborough, on April 13th (A.J.W.). Single birds were seen daily at Spurn from August 27th, when an adult was ringed (R.C., A.L.C.) until September 1st, with at least two present on August 31st (G.H.A., J.L.). On September 7th a bird occurred in trees and on a wall at Ringstone Edge (H.Z.G.).

240. CUCKOO.—First heard in the Vale of Mowbray on April 18th (J.P.U.). Last seen a juvenile at Spurn on September 10th (R.C.). A Cuckoo ringed at Spurn by R. F. Dickens on August 3rd was killed at Genoa, North Italy, on September 11th (E.P.L.). A bird at Kilnsea at 25 yards range on May 25th, presumably female, gave the 'cuckoo' call twice before 'bubbling' (H.O.B.). A Meadow Pipit's nest near Haxby (Wharfedale) held two Cuckoo's eggs and two Pipit's (H. A. Briggs per A. H.-L.).

249. LITTLE OWL.—Following the frost many birds were picked up dead near York (F.J.), three in Colsterdale (R.C.), one near Arthington (Miss Bartle), two at Castley (R. T. Renton), five near Burley (W. Fleisher), and several near Harewood (W.F.F.) and near Hull (G.H.A.), and about Thornton Dale (R.M.G.). The species was reduced in numbers considerably and generally. No nests were found near Nunthorpe where formerly fairly numerous (G.A.E.). But A. Gordon reports the species as numerous as ever about Helmsley.

250. LONG-EARED OWL.—A dead bird was picked up at Wheldrake (B.D.) during the frost. The species was already at a low ebb in Yorkshire. The occurrence of two birds which gave good views well down toward the point at Spurn on

November 1st was interesting (E.C., R.C.). A bird in J.P.U.'s garden at Fullicar on July 9th was some miles away from the nearest plantation of conifers. Breeding occurred near Ampleforth (W.H.W.I.).

251. **SHORT-EARED OWL.**—Two were in Dalby Warren from December, 1946, to January 12th where two had been seen in March, 1946 (R.M.G.). A bird flew about Lawkland Moss on February 15th (C.A.C.) and one at Faxfleet on January 12th (H.O.B.). The species nested (April 4th) on Skipwith Common (B.D.). Odd birds were seen at Spurn during mid-May and from October 13th, and single birds near Kilnsea in March, April, May and November 2nd, one having been seen at Swillington Ing on November 1st (F.R.A., K.D.).

253. **TAWNY OWL.**—Following the frost near Hebden Bridge a dead bird was found 'bound' to a poisoned hen put down for foxes; 'scores were picked up dead in the Helmsley area' (A.G.), one near Middlesbrough (O.C.H.), four were brought to G.H.A. in Hull, a number died near Sheffield (L. Carr), three near Gorpse (B. Astin), two lay on the edge of Gowthwaite Reservoir on March 30th (W.F.F.), and Lord Bolton picked up six in his grounds where they were often seen vainly trying to find food by day. The species was reduced considerably. A nest on May 3rd held one egg, one day-old young, four common Shrews, one Blue Tit, one Whitethroat (W. G. Bramley). A pellet near Dewsbury on August 9th consisted of seeds and grey down, without bones (J.R.).

254. **WHITE-BREASTED BARN OWL.**—During the frost this species often hunted in afternoons about Pallathorpe where W.G.B. picked up two dead. Five birds brought to G.H.A. had apparently starved. Birds also hunted in daylight in the Vale of Pickering (March 5th and 9th) (R.M.G.), and near Masham (R.C.), and at Walton (J.H.), and Denton (W.F.F.) and in Lower Teesdale where a bird was found dead on February 10th (O.C.H.). A late brood near Knaresborough called in the hole until October 12th (A. Moffatt). The species was missing from several regular nest-sites (A.G.).

259. **PEREGRINE FALCON.**—At least one young bird was reared on a gritstone ledge in the north-west. In another area successive clutches of four and two eggs were robbed. Odd birds were seen near Whitby in the early part of the year (A.B.W.), near Masham on August 23rd and October 10th (P.Y.), and at Spurn on August 31st (J.L., G.H.A.).

262. **MERLIN.**—A bird was shot at Esholt S. Works, near Bradford, on February 4th (R.F.D.) and a bird occurred at Kelleythorpe on February 11th (J.H.B.). Single birds were seen near Kilnsea on June 8th and on several dates from August 20th to November 3rd. Two nests were found adjoining Wharfedale (R.F.D., C.F.T.).

263. **KESTREL.**—Additional to the residents, birds passed down at Spurn; the main movement being in evidence from September 17th to October 12th (G.H.A.). A number of emaciated birds were picked up near Sheffield during the hard weather (L. Carr).

268. **ROUGH-LEGGED BUZZARD.**—A bird was shot near Aldborough (East Riding) on April 20th. It contained a stoat complete excepting the head. Two had been seen in the neighbourhood shortly before, one slightly smaller than the other (C.F.P.). Two birds that circled high near Wakefield on November 8th and flew away after an encounter with rooks may have been of this species (J.H.). A bird in Forge Valley first noted on November 16th, and seen by R.M.G. on the 17th to eat a frog beside a stream, was found dead on November 20th and diagnosed as a young male at the Yorkshire Museum (A.J.W.).

269. **COMMON BUZZARD.**—A bird on the moors above Masham on January 1st and 9th (P.Y.) may have been this or the preceding species. Three flew over the hills above Hawse on May 25th (R.B., C.G.). Two were seen near Austwick on May 18th (B.N.S.). Off Bampton on June 8th, well out at sea a bird flew southerly and high (C.H.W.). Noted on several dates near Halifax in November and December (H.Z.C.).

271. **MARSH HARRIER.**—An adult male hunted over the reed beds at Wassand in June and was seen by F. Childs and G.H.A. An immature bird caught alive and uninjured in a trap set for Sparrowhawks was ringed by C. F. Procter on November 13th and subsequently released.

272. **MONTAGU'S HARRIER.**—Birds probably of this species were seen at Spurn on May 9th, 24th and 26th (R.C., R.F.D.). In the North Riding two pairs were suspected of nesting; the young in the only nest discovered were about 18 days

old when ringed on July 6th (R.C.), and one of these young was found dead near Kilnsea on October 18th (F.M.G.). It had probably been dead for some weeks. A bird seen on August 10th above Wharfedale had a very white rump and was joined by two others in the distance—they were possibly of this species (M. and S.B.-S.); as also probably was one seen and heard chattering on September 3rd on moors in the Hebden Bridge area (E.W.W.). Birds were seen at Spurn on August 13th (R.M.G.) and 20th (E. O. Hehn).

273. HEN HARRIER.—A male was seen on April 8th at Spurn (G.H.A.), and a female on September 27th was believed to be of this species (G.R.E., E.C.). On October 12th a female was seen as it came in from far out at sea (R.C., T.M.F., V.M.). A bird occurred at Patrington Haven on February 16th (C.F.P.) and good views were obtained of a female or juvenile hunting over Skipwith Common on November 22nd (J.L.) where a bird was seen in January (B.D.). In the north-east birds were seen on January 15th (W.S.M.), and on November 1st (H.O.B.), and 5th (D. Green).

277. SPARROWHAWK.—Two juvenile males were ringed at Spurn—September 21st (G.R.E., W.F.F.) and October 25th (R.F.D., R.C.) and a bird at Sleights in a hen-run on March 12th (C.E.A.B.). On November 1st a keeper saw a bird struggling with a grouse which was killed (H.O.B.) and the species was reported elsewhere as killing grouse during the hard weather during which one attacked a Magpie near Bolton Abbey and was driven off by the intervention of another Magpie (C.F.T.).

284. OSPREY.—An Osprey that frequented Eccup Reservoir for several days in early May gave good views of its plumage and actions including the plunge (H.W., K.B.). On May 26th an Osprey was seen leaving a tall poplar by Castle Howard Lake, carrying a large fish and being mobbed by Jackdaws (R.M.G.).

289. HERON.—Occupants of Yorkshire Heronries were reduced from 125 in 1946 to 61 in 1947—the result of the severe weather of January to March. Five dead birds were found by Gouthwaite Reservoir on March 30th (K.C.C., W.F.F., H.V.W.). Occupied nests were: Hornsea Mere, 19 (F. Childs); Slensingford, 5 (R.C.); Moreby Park, 1 (E.W.T.); Kiplin, 8 (J.P.U.); Harewood, 4 (W.F.F., W.B.); Gargrave, 7 (W.F.F., J.A.C.); Gilling, 5 (E.W.T.); Shireoaks Wood, 12 (W.B. and R. Carrick). On May 10th a Heron flew high over the Spurn dunes direct out to sea (R.C.); other birds occurred at Spurn on August 8th (G.H.A., R.M.G.) and October 18th (F.M.G.).

297. BITTERN.—On September 5th a bird sheltered below the planks of a boat landing at Ruswarp and allowed itself to be captured and would not fly when released, so was left in a bramble thicket (A.B.W., C.E.A.B.). A bird remained about Hornsea Mere during the February-March period of hard weather (F. Childs). A bird was at Kelleythorpe on January 18th and February 5th, although very conspicuous in the snow it allowed J.H.B. to get within two yards before flying.

300. WHOOPER SWAN.—The species was more frequent than usual. At Semerwater there were 18 on January 1st, five on April 18th and one bird lay dead by the lake (R.C., G.H.A.), and two were there as late as May 21st (R.C.). There were 32 at Eccup (K.B.) and 22 at Fairburn on January 5th (G.R.E., V.S.C., L.B.), and the same number on Fewston Reservoir on the same date were thought to be Whoopers although visibility was poor (W.F.F., K.C.C., H.S.P.B.). Eight on a moorland pool above Wensley on January 5th were seen at intervals later and one was eventually found dead (Lord Bolton).

At Swillington three flew in from the Humber direction on February 22nd and were joined by two more on the 23rd at 4-15 p.m. (A.G.P.) and were seen by B. Speake on March 1st and by the Halifax Group on March 2nd. A bird was on the Ouse at York on February 6th (H.G.B.) and five passed east over York at the end of March (G.W.). Eight Swans, probably of this species, passed over Sleights on February 17th (C.E.A.B.) and there was an adult and an immature bird at Marishes on March 28th (R.M.G.).

Birds were noted at Spurn on November 15th (G.H.A., A.W.) and seven Swans on Hornsea Mere on November 20th were believed to be Whoopers (G.H.A.). Other odd birds were seen in several places.

301. BEWICK'S SWAN.—In the Vale of Pickering there were 17 on January 7th, and 26 on the 17th and 19th (R.M.G.).

A typical bird was picked up dead by Lindley Reservoir on January 6th, the finder saying there were also six on the water. On Fewston Reservoir there were



two on January 19th (W.F.F.). Seventeen on Rivelin Dam, Sheffield, on December 31st had typical bills—they flew eastward on January 1st, 1948 (A. F. Taylor). Three occurred on Walton Hall Lake on April 15th (A.G.P.).

303-307. GREY GOOSE.—Since the Pink-footed Goose predominates at the Humber Winter headquarters, it follows that most of the wanderers in mid-Yorkshire are of the same species; but not all, and it is safer to lump them together except when birds are definitely identified. The following are the principal occurrences—70 near Wakefield on January 9th (A.G.P.), 50 flew west over Swillington on January 12th, and 50 followed the course of the Aire near Bradford on the 17th (K.F.), and over Beeston, Leeds, on March 26th (K.D.). About 400 flew up the Humber on April 9th and divided at the junction of the Ouse and Trent. From March 28th to April 2nd there was a regular nightly movement eastward over York, with a time-table only varying by 18 minutes in the six nights, numbers dwindling nightly from over 200 to 18 (G.W.).

In autumn gaggles of from 35 to 400 passed over the Hull area during October and November, some passing over Driffield from the Humber direction at dusk each evening (G.H.A.). At Gorpel Reservoir geese occurred on several dates with 150 flying south on September 26th (E.W.W.), and 29 flew north-west over Bolton Abbey on October 1st (K.C.C.). 300-400 passed north-west over Thornton Dale on November 6th when Humber side was befogged (R.M.G.), and 150 passed north-west over Masham (R.C.) where about 200 passed north-east at dusk on the 19th (P.Y.). On November 23rd 40-50 flew south-east at Sleights (C.E.A.B.).

303. GREYLAG GOOSE.—Three came from east over Pickering Marishes on January 17th (R.M.G.).

304. WHITE-FRONTED GOOSE.—Seventeen flew south-west over Leeds on March 22nd at 8-30 a.m., showing their black breast markings plainly (K.D.). The head and feet of an immature bird received on December 21st, 1946, from H.O.B. at the Yorkshire Museum were of this species (E.W.T.). Twenty were at Leven Carr from early to mid-January (T. E. Richardson).

307. PINK-FOOTED GOOSE.—54 came over Thornton-le-Clay at 10-30 a.m. on April 3rd and passed north-west (R.F.W.). 16 birds flew north-west at Tees-mouth on October 5th (A. Baldrige, K. Grainger). At Spurn 16 birds were seen on September 24th with smaller numbers to October 15th (G.R.E., W.F.F.).

311. BARNACLE GOOSE.—A bird was shot on the Humber near Ferriby in early February (E.B.B.).

312. DARK-BREASTED BRENT GOOSE.—Birds were present at Spurn from February 1st to 4th when they numbered 30 (G.R.E.) and were also noted by A.F.T. and C.H.W. Small numbers occurred in late October and November. H.O.B. saw display on January 26th, and on November 23rd when 16 were present there.

314. CANADA GOOSE.—Additional to the usual park habitats breeding occurred at Swinsty Reservoir (K.C.C.) and Walton Hall Lake (A.G.P.).

315. SHELD-DUCK.—At Swillington Ing there were two on April 4th (F.R.A.) and 13th (B.S.). From August 14th to October 25th Sheld-Ducks up to seven in number were usually present and were reported on various dates (L.C., A.F.T., M. and S.B.S., B.S., K.D., F.R.A., A.G.P., etc.). Birds were also seen, one at Eccup on April 26th (F.R.A.); one at Bottomboat on April 14th; five at Winterset on September 27th (A.G.P.). All these occurrences inland are in or adjacent to the Aire Valley by which passage from coast to coast is probable.

318. GADWALL.—The white patch on speculum was shown by two birds at Lindley Reservoir on January 19th (R.F.D.) and single birds occurred at Swillington Ing on August 17th (B.S., K.D.) and on November 29th (F.R.A.).

319. TEAL.—At Hornsea Mere on January 18th Teal were estimated at 1,000 birds (E.C.). At Gorpel 205 were counted on October 5th (E.W.W.).

322. GARGANEY.—A pair were on Mickletown Flash, Methley, on May 8th and a Drake at the adjoining Swillington Ing on May 9th and 25th. Of 17 eggs taken from a boy at Fairburn six agreed with this species in appearance and measurement, and were polished by sitting, but did not hatch when placed in an incubator (A.G.P.). An adult and two young were seen on Burton Constable Lake in June (G.H.A.). Two were seen on Ripley Park Lake on August 10th (K. M. Lewis).

323. WIGEON.—Generally present, often in considerable numbers, in winter on Hornsea Mere, Semerwater, Farnley and Ripley Park Lake, Gouthwaite, Winterset and other reservoirs and Swillington Ing—where from August 30th with one



bird present numbers grew by the end of September to a large figure (F.R.A., B.S., K.D., A.G.P.). At Spurn about 600 were present on February 1st (G.R.E., G.H.A.) and in autumn from the first appearance of an odd bird on August 28th numbers grew gradually to about 500 on November 8th.

325. **PINTAIL**.—Small numbers occurred in early spring and autumn and winter at Hornsea Mere, Spurn, Teesmouth, Swillington Ing, Bretton Park Lake, Eccup Reservoir, Winterset Reservoir, August 17th at Swillington Ing, and two at Spurn on September 21st were early dates.

326. **SHOVELER**.—The species was seen on January 15th at Hornsea Mere about 20 (G.H.A.), and at Lindley Reservoir two, two pairs at Skipwith on May 10th (E.M.R.), four at Bretton on August 9th (J.C.S.E.), six at Farnley Lake on August 17th (K.C.C.), and about 20 there on September 28th (W.F.F.), two at Swillington Ing on October 26th (A.G.W.), three drakes on Ripley Park Lake on November 2nd (A.G.W.).

At Spurn one bird occurred on August 11th (R.M.G., G.H.A.) and two on September 2nd (E.C.).

328. **POCHARD**.—Small numbers were seen on Gorple Reservoir, Ringstone Edge Reservoir, Bretton Park Lake, Chelker Reservoir, Malham Tarn, Redmires Dam—Sheffield, Winterset Reservoir, Marfield Pond, Masham—Gowthwaite Reservoir, Swillington Ing, on various dates out of the breeding season. A few pairs were on Castle Howard Lake throughout the summer (E.W.T.), and two were on Farnley Lake on July 11th (J.R.). Over 20 at Winterset on December 10th was the largest number recorded.

329. **FERRUGINOUS DUCK**.—At Ringstone Edge Reservoir on January 1st a bird in company with five Pochards was at first thought to be a female Tufted Duck, then showed its white under tail-coverts very clearly (G.R.E.).

330. **TUFTED DUCK**.—Three pairs bred at Bretton producing twelve young (J.C.S.E.) and two ducks had 19 young between them at Swillington Ing on July 20th (F.R.A.). The species occurred on various waters but was less numerous than usual.

331. **SCAUP**.—Numerous off Scarborough during the severe period and large numbers died (A.J.W.). At Spurn there was a 'raft' of about 200 in January (G.H.A., J.M., E.C.). Near Hesse there were 12 females on February 1st (E.C.). Farther inland the species occurred at Winterset Reservoir, three on January 16th (J.H.), and one on October 17th (J.R.) and at Swillington Ing on various dates in January to March and October to December, nine on February 23rd (A.G.P., B.S.) being the largest number. At Teesmouth there were four on November 3rd (A.B., K.G.).

332. **GOLDENEYE**.—Reports of this species, far too many to enumerate, came from waters near Masham, York, Romalldkirk (April 19th, G.R.P.), Swinsty, Lindley, Fewston, Gowthwaite, Winterset, Fairburn, Eccup, Hawksworth Dam, Swillington Ing where a male occurred as late as May 11th (F.R.A.). Numbers nowhere on any date exceeded the 11 at Eccup on October 19th (K.B., M. and S.B.S.). The earliest report of autumn inland came from Swillington Ing on October 19th (B.S.); at Spurn two birds were seen on October 12th (H.O.B.) and in Bridlington Bay about 100 on October 18th (A.F.T.).

339. **COMMON SCOTER**.—Seen regularly at Teesmouth in winter in small numbers (A.B., K.G.). A drake was shot at Winterset on January 5th (A.G.P.). Many were about Scalby in the rough weather (G.W.). About 100 flew north at Spurn on August 12th (G.H.A., R.M.G.). A number of birds occurred inland in autumn—six at Blackmoorfoot, Huddersfield, on July 6th (J.C.S.E.), single drakes at Eccup on the 29th (F.R.A., K.B.) and Swillington Ing on August 3rd and October 19th (A.G.P., F.R.A.), with five on August 17th (K.D.), and seven drakes and two ducks at Winterset on July 13th (A.G.P.), and 20 at Eccup on July 13th with smaller numbers on other July dates (H.W.).

340. **VELVET SCOTER**.—An adult drake occurred at Winterset on January 26th (A.G.P.) and one was shot near Huby in February (A.H.L.). Four were at Teesmouth on October 12th (A.B., K.G.) when a bird was seen at Spurn, and six on the 13th (R.C., T.M.F.).

342. **GOOSANDER**.—Birds were generally present at Eccup up to May 8th, and from November 29th, with five males and 21 females on January 26th, and about 50 on February 15th (H.W.) as the greatest numbers on a day (M. and S.B.S., K.D., B.S., F.R.A., K.B.). During the frost a few birds occurred on the

Wharfe (H. C. Stenbridge). Three drakes were at Romalldkirk on April 19th (G.R.P.). Other birds occurred at Redmires near Sheffield, on the Nidd at Knaresborough, at Gowthwaite and Lindley Reservoirs, at Bretton on November 29th, and at Swillington Ing on several dates in November. Birds were also seen in Thornton Dale and at Scarborough in January and November, six at Faxfleet on January 12th (H.O.B.) and several on Hornsea Mere up to April 4th (A.D., E.C.).

343. RED-BREASTED MERGANSER.—Occurrences were noted—three ducks in Whitby Harbour on February 10th (A.B.W.); three drakes at Teesmouth on March 15th (O.C.H.); one at Spurn on February 1st (G.H.A., G.R.E.), and on October 18th (F.M.G.), with two ducks at Eccup on February 8th (K.B., H.W.), and a single bird there on December 14th (M. and S.B-S.).

344. SMEW.—There were seven on the Humber on January 25th (E.B.B.), a drake in Whitby Harbour on February 10th (A.B.W.), and a red-headed bird at Scarborough for several days before and after February 18th (A.J.W., R.M.G.). Two females were on Hornsea Mere in January (E.C., D.U.). Both sexes occurred on various dates up to April 6th at Swillington Ing, and at Winterset (J.E.B., F.R.A., A.G.P., J.H.) with two drakes and three ducks at the former on January 25th as the largest number. A pair were at Roundhill Reservoir, Masham, on January 20th (P.Y.) and one on Lindley Reservoir on January 24th (R.F.D., P.E.D.).

348. SHAG.—Two at Bridlington on February 15th were in an exhausted state (E.C., S.H.). A bird at Stape (near Pickering) in mid-July wandered about the fields and eventually died (R.M.G.).

349. GANNET.—Up to four birds were seen at Bempton in spring, from April 12th (H.F.W.); three were on the old nesting ledge on June 17th but J. Petty does not think the species bred this year. An adult with a broken wing, which subsequently died, was found near the railway at Haworth and handed to the Keighley Museum in January. Several were off Flamborough on days from October 19th to November 10th and E.C. found nine dead on the Hornsea beach from February to April.

355. MANX SHEARWATER.—A single bird flew south at Spurn on September 21st and two Shearwaters flying north on September 30th were believed to be of this species (G.R.E.), as was also a bird watched on the Humber side of the Spurn peninsula on October 5th and 6th (M. and S.B-S.). A Shearwater possibly of this species was seen off Spurn on June 7th (H.O.B.).

368. FULMAR PETREL.—A bird was seen dead on the beach at Hornsea on April 6th (E.C.). Five birds had returned to Castle Rock, Scarborough, by December 25th (S. Rowntree) and the status generally remains unchanged.

370. GREAT CRESTED GREBE.—Pairs were known to breed on at least twelve waters. The total of birds recorded between May 1st and June 15th was slightly less than in 1946. The species figured among birds found dead alongshore at Bridlington and Hornsea during the frost (E.C., G.H.A.).

371. RED-NECKED GREBE.—A bird was seen near Scarborough on January 12th (A.J.W.).

373. SLAVONIAN GREBE.—A bird was seen just outside Scarborough Harbour on January 2nd and a second bird was found dead on the shore in the hard weather (A.J.W.).

374. BLACK-NECKED GREBE.—A very tame bird at Teesmouth on February 22nd allowed watching at ten yards range and was subsequently shot by a shore gunner (A.B., K.G.). A bird was seen at Winterset on April 6th and at Bottomboat on the 27th and on several dates in autumn at Swillington Ing from August 10th (A.G.P., B.S., M. and S.B-S.). At Winterset two birds on October 20th frequently gave a rather harsh trilling call (A.G.P.). A bird occurred at Eccup from January 12th to 19th and on August 3rd (H.W.).

375. LITTLE GREBE.—This species was greatly reduced in numbers this year on Yorkshire waters where usually several pairs breed, e.g. Wakefield area (A.G.P.), Fairburn (B.S.), Gowthwaite (R.C.) only odd broods were reared.

376. GREAT NORTHERN DIVER.—At Winterset Reservoir a bird of this species gave good views on January 26th (A.G.P.), and January 29th (J.H.) and a bird was there still in winter dress which flew about restlessly and called on April 13th (A.G.P.). A bird in Bridlington Bay on September 27th was watched at 20 yards range from a boat (R. Bramhill).

378. BLACK-THROATED DIVER.—A bird was found dead in winter plumage by Hornsea Mere in May and taken to the Hull Museum (G.H.A.). Two dead birds were found on the beach at Hornsea on March 25th (E.C.).

379. RED-THROATED DIVER.—Three birds lived in Scarborough Harbour at the end of January for a week (A.J.W.). A bird remained on the Wharfe near Ilkley for some days from February 5th where it swam, dived, and preened whilst squatting on ice (W.F.F.); it was possibly the bird noted by A.H.L. in March. On February 17th a bird was found in the yard of a Sheffield hotel and was put on a barge for releasing in the Humber (A. W. Goodwin). A bird at Eccup in winter plumage on May 6th was seen at intervals until May 31st and had then assumed breeding plumage (H.W., K.B.), and was seen on May 18th and 26th by K.D. and F.R.A. Fifteen divers believed to be of this species were seen passing north at Spurn on April 7th in half-an-hour (R.M.G., C.E.A.B., L.B.). Noticed at Spurn moving south on various dates from September 11th to October 18th with a maximum of ten on September 28th (G.H.A., G.R.E., etc.). There were two at Bridlington on January 19th and one on February 28th (E.C.), and several on September 18th (A.F.T.), and one on Hornsea Mere on April 3rd (E.C.).

380. WOOD PIGEON.—In the long severe period birds became desperate, raiding greens in gardens in the snow, and very large numbers were shot. A bird ringed at Harewood by M. Hardy as young on July 23rd, 1945, was recovered at Ulceby (Lincolnshire) on February 22nd, 1947—52 miles east-south-east (E.P.L. in *British Birds*).

381. STOCK DOVE.—Two birds occurred at Spurn on May 27th (R.F.D.). Members of a flock of some 50 birds on December 6th alighted on Hornsea Mere, treading water with their feet and repeating the action after flying round to hover again over the same patch of water (E.C.).

383. TURTLE DOVE.—The earliest record was at Kelleythorpe on May 3rd (J.H.B.). A nest with two eggs at Harrogate on May 17th was early (J. R. Wheeler). The species is showing a slight tendency to occupy higher plantations, and since 1944 has been breeding just below the 1,000 feet contour in Rosedale (H.O.B.). Druid's Plantation, Ilton, which a pair have first occupied in 1947, is about the same altitude (P.Y., R.C.).

386. BAR-TAILED GODWIT.—Recorded at Spurn during most of the year in small numbers, with the largest parties between April 26th and May 13th, 40 on May 9th (R.C.) and seen regularly at Teesmouth in small numbers (A.B., K.G.). Five seen at Malham Tarn on June 29th were not in breeding plumage (K.C.C., H.S.P.B.).

387. BLACK-TAILED GODWIT.—Four occurred at Spurn on April 26th (E.H., G.H.A.) and 46-48 at Marishes, Vale of Pickering, on the same day were mostly in breeding plumage (R.M.G.). A party of six were at Swillington Ing on July 13th (K.D.).

388. CURLEW.—Two birds on Clifton Ings, York, on March 9th, were almost too weak to fly (E.W.T.). Birds appeared on the moors on March 16th with the beginning of the thaw (C.A.C.) and in the next few days were seen on various breeding grounds.

389. WHIMBREL.—A bird flew calling over Eccup on July 26th (K.B.) and over Swillington Ing on August 3rd (K.D.), and one was noted at Winterset on the same day (A.G.P.). A bird was noted at Spurn on February 2nd (A.F.T.) and a few birds were seen there on the spring passage from May 4th to 28th. In autumn, after the first record on July 13th, a bird or two could be seen on most days.

393. WOODCOCK.—In Thornton Dale a bird was seen at the beck in the main street on February 26th and one was found dead in the village on March 4th (R.M.G.). In Peasholm Park, Scarborough, there were considerable numbers during the severe weather (A.J.W.).

Roding was first seen above Masham on April 1st (P.Y.). A nest was found at Kilburn on April 26th (B.D.) and five turned up near New Parks, Shipton (F.J.). Immigrants were noted in the Kilnsea area from October 26th to November 1st (R.C.). One flew in from sea near Staithes on October 18th (R.S.).

395. COMMON SNipe.—Drumming occurred at Hebden Bridge on March 20th (F.D.) and over Farnley Moor on July 11th (J.R.). On September 11th over 80 were counted probing the mud at Gowthwaite with the water very low (K.I.). A few birds were recorded at Spurn up to April 8th and after September 19th.



398. JACK SNIFE.—A few birds were seen during the early months in the Vale of Mowbray (J.P.U.), at Kelleythorpe (J.H.B.), at Hessle (E.C.), in Airedale (F.R.A., P.B.) and near York (E.W.T.). First seen in autumn at Keld Head on October 9th (R.M.G.).

400. GREY PHALAROPE.—At Eccup Reservoir on October 1st, a Phalarope in winter plumage seen at six yards range had too stout a bill for the red-necked species as it bobbed about the choppy water. It was also seen in flight (M. and S.B.S.).

401. RED-NECKED PHALAROPE.—A bird swam an erratic course in a channel at Teesmouth on October 12th, jerking head and neck and often came ashore to run about on mud (A.B., K.G.).

402. TURNSTONE.—Always present at Spurn, with maximum estimate of 500 on September 8th (R.C., G.H.A.). Occurred at Eccup on January 11th (K.B.) and at White Holme Reservoir on August 24th; nine August 28th-31st, and one on September 7th (H.Z.G.). At Swillington Ing, a single bird was seen on eight dates between August 3rd and 31st (B.S., K.D., A.G.P., F.R.A.).

403. KNOT.—Flocks in autumn at Teesmouth numbered up to 150 birds (A.B., K.G.). At Spurn maximum estimated numbers in autumn reached several hundred birds. Nine birds at High Royd S. Farm on April 24th included two in breeding plumage (H.Z.G.). A bird at Swillington Ing on July 5th showed breeding plumage (B.S.).

404-405. DUNLIN.—Maximum numbers occurred at Spurn in October, estimated at 700 birds on the 17th (F.M.G.) and always numerous at Teesmouth (A.B., K.G.). Occurred frequently in parties at various times of the year in the Aire Valley and at neighbouring waters (F.R.A., A.G.P., K.D., B.S.). A pair had young in Coverdale on June 15th (J.P.U.).

406. CURLEW SANDPIPER.—A single bird was recorded at Spurn on May 11th (R.C., G.H.A., J.R.W.) and a few birds occurred in autumn from August 16th to October 11th with five as the maximum on October 9th (R.C., G.H.A., E.C.). A single bird was seen at Teesmouth on October 4th (A.B., K.G.).

407. LITTLE STINT.—A party of eleven was seen at Spurn on May 24th (R.F.D., G.H.A.), when H.O.B. saw two in breeding plumage at Kilnsea; there were nine at Spurn on the 26th (R.F.D.); and odd birds were seen on February 3rd (G.R.E.), September 12th (R.C.), October 30th and November 1st (R.C., A.L.C., E.C.). At Swillington Ing there was a bird with Dunlins on September 27th (B.S.).

409. TEMMINCK'S STINT.—A Stint at Swillington Ing on May 12th in company with a Dunlin and two Common Sandpipers was thought to be of this species in the poor light (M.F.M.M.). Another bird there on October 19th was extremely tame and observed at a range of eight feet. It displayed its white outer tail feathers when it flew (K.D., B.S.).

414. RUFF.—All the records were in autumn. At Swillington Ing three or four birds were present from August 17th to September 2nd (A.G.P., B.S., F.R.A., K.D.). At Alltofts one bird on August 22nd (B.S.). At Winterset one Reeve on September 26th-28th, and at Bottomboat two Ruffs on August 24th (A.G.P.). Two at Stone Creek on September 15th (E.W.L., J.D.G., A.R.S.); five at Kilnsea on October 7th (R.C.); four at Cherry Cob Sands on August 28th, and seven there on September 2nd (H.O.B., L.S.), and two there on September 14th (E.C., J.W.).

415. PURPLE SANDPIPER.—Scarce as usual at Spurn where single birds were recorded on September 28th (G.R.E., L.B., P.E., E.C.) and November 15th (G.H.A., A.W.). Single birds occurred at Teesmouth on October 12th and November 23rd (A.B., K.G.). At Bridlington, various numbers up to 30 were recorded on several dates at each end of the year (J.H.B., G.H.A., E.C., C.H.W.).

416. SANDERLING.—150 on October 4th was the largest estimated number at Spurn where birds could be seen on most days. On Redcar Sands it is regarded as the commonest wader (A.B., K.G.). Birds were seen at Swillington Ing on May 7th and 25th and two on the 26th (A.G.P., K.D.). Three occurred at White Holme Reservoir on August 21st (H.Z.G.).

421. COMMON SANDPIPER.—Was seen on the Nidd near Harrogate on April 12th (K.I.). Of about 35 at Swillington in the evening of July 29th, 22 fed, rested and took wing as a company, and the other birds did not join them (A.G.P.). Last seen at Winterset, a single bird on September 28th (A.G.P.) and at Hornsea Mere on October 3rd (E.C.), and at Swillington on October 11th (F.R.A., K.D.).

423. WOOD SANDPIPER.—At Stanley S. Farm on August 14th it was possible to glass a Wood, a Green, and a Common Sandpiper together (A.G.P.). At



Swillington Ing on August 20th a Sandpiper obviously neither 'Common' nor 'Green' was considered definitely to be of this species (B.S.).

424. GREEN SANDPIPER.—A bird at High Royd S. Farm from July 27th to August 1st was caught in the trap and ringed (H.Z.G.) being the first of the species to be ringed in this country. There was the usual crop of records at Swillington Ing from July 27th to October 19th (F.R.A., B.S., K.D., A.G.P., M. and S.B.S.), six being the largest number seen on one day on August 3rd (A.G.P.). The species was also recorded during the same period at the reservoirs of Gouthwaite (R.C.), Eccup (N.W., K.B.), Stocks (C.O.), at Bretton Park (J.C.S.E.), Stanley S. F., and Altofts Gullery (A.G.P.) and near Rye House, Helmsley (A.G.).

428. REDSHANK.—Estimates of flocks at Spurn in early October numbered up to 200 birds (R.C.); similar numbers are often spread over the flats at Teesmouth (A.B., K.G.).

431. SPOTTED REDSHANK.—A bird frequented Swillington Ing from August 24th to 31st (A.G.P., K.D., B.S., F.R.A.) and may have been the same bird noted at Bottomboat on the 26th (B.S.); but a bird at Altofts Gullery on August 27th showed plumage differences, and one bird was there again on the 30th (A.G.P.). An odd bird occurred at Spurn on October 12th (R.C.) and three were noted on Cherry Cob Sands at close range in a good light on September 2nd (H.O.B., L.S.).

432. GREENSHANK.—A bird occurred on the spring passage at Stanley Sandpits, near Wakefield, on May 14th (A.G.P.). At Swillington Ing, Altofts, Bottomboat, and Stanley Sewage Farm, from late July to mid-September, numerous records were made, with seven birds on September 13th as the largest number on one day (A.G.P., K.D., F.R.A., B.S.). Birds were also seen in the same period near Ilkley (W.F.F.), at White Holme Reservoir (H.Z.G.), Stocks Reservoir (C.O.), Eccup Reservoir (K.B., H.W.), and on several days at Spurn in August with three as the largest number on the 13th (R.M.G., G.H.A.). A bird occurred on Cherry Cob Sands on August 28th and September 2nd (H.O.B., L.S.) and two by Hornsea Mere on October 3rd (E.C.).

435. RINGED PLOVER.—Parties were more frequent and more numerous than usual in spring by inland waters in and adjoining the Aire Valley, with 11 as the maximum on one day at Bottomboat on April 25th.

438. LITTLE RINGED PLOVER.—The claims of this species to a place on the Yorkshire list were rejected by the late T. H. Nelson. It is pleasant now to have to record it as a visitor of 1947 to the West Riding where a bird in flight on May 25th was identified by the flight call and absence of white wing-bar and was also seen at rest, and compared in detail with an adjacent *hiaticula*. It was seen on several occasions up to the end of May and also occurred in August when its identity was again carefully checked by several observers (A.G.P.).

439. KENTISH PLOVER.—On May 11th at Swillington Ing a bird was approached to within 30 yards and examined through telescope and binoculars in detail. It was in company with a Ringed Plover, against which its black bill and legs, and sandy-brown general appearance were very noticeable (K.D.). On September 15th at Hornsea Mere a dark-legged bird with the other characteristics of this species, in company with some Dunlins, was recognised after a detour had been made so that the light fell on the bird (R.C., H.G.B.).

440-441. GOLDEN PLOVER.—Arrived on the Burley Moor on March 19th (W.F.) and in Wensleydale (J.P.U.) and on Ilton Moor on March 20th (P.Y.). About 250 birds near Romalldkirk on April 19th were probably of the northern race (G.R.P.). At Swillington Ing on December 20th flocks were estimated at 800 birds (B.S.), with about 400 still there on the 31st (F.R.A.). A flock of 300 birds occurred at Spurn on November 3rd (G.H.A., R.C.).

444. GREY PLOVER.—Present at Spurn all the year in small numbers with about 250 birds on April 6th (R.M.G., C.E.A.B., G.R.E.). Two birds occurred at Swillington Ing on May 25th, one being in breeding plumage (A.G.P.). Several were in stubble at New Marske on November 26th with Lapwings and Golden Plovers (J.P.U.). A bird at Ilton Reservoir on November 21st allowed a close approach (P.Y.).

446. DOTTEREL.—Six on May 12th on the high ground of Ilton Moor 'were the first I have seen there' (P.Y.). Two birds were seen on Middlesmoor on April 22nd by H. J. Stickland of Harrogate (G.K.Y.).

449. LAPWING.—Returned to the moors at Austwick on March 16th (C.A.C.). A bird ringed at Sedbergh by Sedbergh School, as young on July 12th, 1942, was

recovered at St. Jean de Luz, France, on February 1st, 1947. A bird ringed near Bolton-by-Bowland as young by C. Oakes June 24th, 1945, was recovered at Ballingarry, Limerick, December 1st, 1946. A bird ringed at Great Mytton as young on June 24th, 1943, by C. Oakes was recovered at Lanesborough (Longford) on January 23rd, 1947. A bird ringed at Padiham (Lincs.) June 28th, 1945, by J. J. Boon was recovered at Knottingley, December 5th, 1946 (E.P.L. in *British Birds*). Noticeably fewer this year was the comment of many. A keeper who asked a tractor driver to stop and lift the eggs in a nest and to replace them after going over the ground received the reply: 'Oh, we don't do that, we go straight over them.' (R.C.). A. Gilpin puts the reduction from 1946 at 70 per cent. Immigrants in autumn were fewer, too.

451. AVOCET.—A bird occurred at Teesmouth on September 9th (J.P.U.).

452. OYSTERCATCHER.—Birds occurred inland on May 18th near Austwick (C.A.C.); one by the Ure near Hawes at Whitsuntide (C.G., R.B.); one by the Wharfe at Pool Bridge on August 28th (H.M.); one at High Royd on July 26th, and one at Withens Reservoir from August 17th to 21st (H.Z.G.). About 20 birds are usually present at Teesmouth in winter (A.B., K.G.). Small flocks passed regularly along the coast near Scarborough throughout the year (A.J.W.). A pair bred at Spurn, where small flocks were not infrequent, with 60 birds on April 26th and May 3rd as the maximum (G.H.A., E.H., R.C.).

462. BLACK TERN.—An adult was seen at Swillington Ing on May 25th (A.G.P., K.D.), and there were two at Fairburn on June 15th (A.G.P.). On June 3rd a male bird was watched for an hour hawking over the sea at Hornsea (G.H.A., E.E., M.E.). A single bird flew south over Knaresborough on September 22nd (R.H.). There was one over White Holme Reservoir on August 15th (H.Z.G.).

467. SANDWICH TERN.—Spring passage first noted at Spurn, eight birds on May 23rd (G.H.A.) and two on June 2nd (H.O.B.). Autumn passage was noted at Scarborough during the second half of August (A.J.W.) and at Spurn up to October 13th, with 150 recorded on August 9th (R.M.G., G.H.A.).

469-470. COMMON AND ARCTIC TERN.—An unusual inland visitation of Terns happened from April 22nd to early May, with 10 at Eccup on May 4th as the largest number at one place on one day. Floodwaters, reservoirs, sewage farms and rivers were visited at High Royd, Winterset, Eccup, Ilkley and district, Wensley, York, Swillington Ing and other places. Some waters were frequented for a week or more by parties of birds. Most were considered to be Arctics, and a few were Common. A bird picked up dead in Buttercrambe Woods on April 25th (R.F.W.) and one brought to the Yorkshire Museum (E.W.T.) proved to be Arctic.

Some later occurrences were also possibly related. July 13th was the date of the appearance of three at Chelker (W.F.F.) and three at Winterset (J.H.). Two at Blackmoorfoot, Huddersfield, on July 26th (J.C.S.E.) were followed by one (Common) at Swillington on the 27th (F.R.A., K.D.). In September, one at Winterset on the 20th (A.G.P.) was followed by three (Common) in Wharfedale on the 21st (J.P.B.) and one over Stanley S. F. on the 23rd (A.G.P.). The last seen inland, a Common Tern on October 25th at Winterset (A.G.P.) was later by ten days than either species was seen at Spurn.

471. LITTLE TERN.—Odd birds occurred at Chelker Reservoir on May 4th (W.F.F., K.C.C., H.V.W.) and at Winterset on May 11th (A.G.P.). At Spurn first noted, five on April 26th (G.H.A., E.H.) and last recorded on September 30th (G.R.E.). Our watcher was unable to prevent considerable damage in the breeding colony by visitors and only two fledged young birds were seen (G.H.A.).

GULLS.—The long severe spell affected the whole family and Gulls appeared everywhere. At Swillington Ing up to 20,000 roosted nightly, wandering far and wide daily in search of food, and including Black-headed, Herring, Common, Greater Black-backs, two Scandinavian Lesser Black-backs, and a Glaucous (B. Speake). At Eccup up to 6,000 roosted, with a preponderance of Herring Gulls (G.R.E.).

477. LITTLE GULL.—A juvenile occurred at Scarborough on February 1st (A.J.W.); two were seen at Withernsea on August 15th (W.B.A.) and one with Black-heads at High Royd Sewage Farm on October 23rd (G.R.E.).

481. COMMON GULL.—Birds increased in numbers on the Wolds in March and had almost disappeared by May 6th. 6,000-8,000 birds were estimated on April 4th to be passing eastward from flood-water near Garton Station as part of a roost-movement which had been noted near Kelleythorpe (J.H.B.). Considerable

southward movement occurred at Spurn on April 7th with other species of Gull (H.O.B.). This species occurs inland much more frequently than was formerly usual, apart from the influx of the abnormally cold period and is a regular visitor to Halifax except in the breeding season (H.Z.G.). It was always present at Eccup from August 2nd with about 1,000 birds on two dates in August (M. and S.B.S.). About 200 flew south over Ilton Moor on October 12th (P.Y.).

482. HERRING GULL.—Bred on roofs of houses and shops at Whitby and Robin Hood's Bay (C.E.A.B.), and at Colburn Nab, Staithes (O.C.H.). At Swillington Ing on October 19th, a bird with yellow legs which allowed good views had also a pale yellow bill without a red spot, had no white tips to the black on the primaries, and had a slightly *paler* mantle than normal with Herring Gulls (K.D. B.S.); apparently an aberration.

484-485. LESSER BLACK-BACKED GULL.—Roeburndale Gullery (Lancashire) is now intersected by the county boundary and about one-eighth of the total breeders are sited in Yorkshire. There were never less than 1,000 birds on the site in the breeding season including a number of non-breeders. Over 300 young were ringed there by N. Duerden and R. M. Bond (C.O.). Two pairs nested below Rockcliffe (Boulby Area) (R.S.). Two birds near Wakefield on February 1st were of the Scandinavian race (B.S.) and one at Swillington Ing, with five of the British race on May 6th, where an influx of adults (British race) occurred in late July, 87 seen on July 23rd, dwindling to three on the 26th (A.G.P.).

486. GREAT BLACK-BACKED GULL.—Has become commoner inland in recent years in winter in the West Riding and was seen at Swillington Ing with maximum 14 on January 5th (A.G.P., F.R.A., K.D.); a few were also at Eccup. At Lofthouse near Wakefield, from late January to March 15th, the species visited manure heaps, with other Gulls, Crows, etc., 40 Great Black-backs being there on January 31st. At Eccup Reservoir on December 28th there were nine adults and five immature birds (B.S.). Captain Stam noted a southern movement off the north-east coast on October 5th (O.C.H.). There was a large influx near Scarborough in October, especially on the 11th. At Spurn the usual congregations occurred from late July throughout the autumn, the largest estimate of numbers being made on September 5th—250 birds (E.C.).

487. GLAUCOUS GULL.—During the severe weather there were several immature birds at Scarborough (A.J.W.), including four on January 14th and one inland at Marishes (Vale of Pickering) (R.M.G.). A mature bird was seen at Spurn on February 5th (G.R.E.), one at Bridlington on January 27th (J.H.B.), and one on Hornsea shore on March 22nd and April 3rd (E.C.). An adult explored manure heaps near Wakefield with numerous other Gulls on January 31st (B.S.). On September 14th a very large Gull flew over Tilmire, York, with silvery back and no black on primaries (E.W.T.).

488. ICELAND GULL.—A bird of Herring-gull size at Eccup Reservoir on January 4th with pale mantle and wing-tips was thought to be an Iceland (B.S., K.D.). A bird in Whitby Harbour on April 4th with Herring Gulls had a small head, long wings, extensive black tips to mandibles and was of general biscuit colour (E.W.T.), a similar bird was there on May 15th (J.E.B.), and a bird had been noticed there on January 31st with wing tips extended well beyond its tail, the size of which could be compared with other Gulls present (A.B.W.).

491. GREAT SKUA.—Single birds were recorded at Spurn on August 9th (R.H.), 11th (R.M.G., G.H.A.), 31st (G.H.A., J.L.), September 23rd (G.R.E., W.F.F.) and October 6th (M. and S.B.S.).

493. ARCTIC SKUA.—Occasional birds were recorded at Spurn from August 8th to October 25th. On September 21st, 28 birds were counted moving south in one hour (G.R.E., W.F.F., L.B., H.W.).

496. RAZORBILL.—Numbers were off-coast near Spurn on August 31st (G.H.A., J.L.). Passages south could be seen off Scarborough on October 12th (A.J.W.). Three were found dead at Hornsea in early April (E.C.).

498-499. GUILLEMOT.—Many dead birds were on the East Riding shore after the severe weather; four dead at Hornsea on March 15th were of the northern race (E.C. confirmed by A. Hazelwood).

502. LITTLE AUK.—Several were found dead on Scarborough beach in last week of January and one alive in Mrs. Leafe's garden some miles inland (A.J.W.). Remains of a bird were found on the cliffs at Bempton on April 6th (E.C., A.H.), and one on the beach between Bridlington and Skipsa on October 26th (M. and



S.B.-S.). On Redmires Dam, near Sheffield, after northerly gales, there were two on November 27th (A.F.T.).

503. PUFFIN.—Four were dead on Hornsea Beach in March and early April (E.C.).

504. CORNCRAKE.—In a number of areas birds were seen and heard—Austwick, Garsdale, Ulley near Rotherham, Bentham, Skipton, Weeton, Wakefield, Walton, Bradley, Knaresborough, North Dalton, Harpham, and near Scotch Corner. A nest with eggs was inspected at Masham on May 28th but got robbed (R.C.). At Cowling a pair of birds were killed by a reaper on July 1st and a nest with four eggs was found (T. Smith). At Lawkland a farmer over-ran a brood and killed most of them (C.A.C.). Four young were seen on September 7th near Topcliffe (J.P.U.). A bird was recorded at Spurn on October 3rd (G.R.E., L.B., P.E.).

509. WATER RAIL.—Birds occurred at Spurn on February 1st (G.R.E.) and April 11th (G.H.A.); one at Hornsea Mere on January 4th and 18th (E.C., A.D.), and one at Methley on November 30th (P.B.). At least three wintered in 1946-47 by Scarborough Mere and had returned by November 26th (A.J.W.). Mr. Adam Gorden describes the species as unusually numerous in the Helmsley area in October and November.

510. MOORHEN.—Reduced by the severe weather in some areas; less so in others. F. Dean watched a juvenile feed on fallen balsam blossoms on August 27th. There were about 40 on one small pond near Beverley on November 22nd (G.H.A.).

511. COOT.—Much more reduced in numbers than the preceding species (A.G.P.). At Farnley Lake 251 were present on January 1st on a small open patch of water; on April 9th there were 22; several were picked up dead (W.F.F.). During the frost some took to rivers and there were several on the Wharfe at Arthington on March 9th (H. Marjoram). Winterset Reservoir had large numbers in the winter months (J.R.). At Hornsea Mere numbers were estimated at 800 and during December numbers were approximately the same, in spring and summer birds were far fewer. Near Scarborough numbers increased considerably during the hard weather and Scarborough Mere held about 200 (A.J.W.).

513. BRITISH BLACK GROUSE.—Cockbirds were seen near Hubberholme on April 13th (J. A. Chadwick, W.F.F.) and on Ilton Moor on March 31st with a greyhen nearby on November 5th and December 1st (P.Y.).

514. RED GROUSE.—As usual during long periods of frost and snow, many birds left the moors, and fed on hawthorn buds in Wharfedale (W.F.), where some were seen in gardens, on the river bank, and even one in a house in Ilkley (W.F.F.); the same kind of thing happened in Rosedale and elsewhere. Single birds appeared at High Royd Sewage Farm on March 16th and 18th and one was caught alive in a basement in a main street at Halifax (H.Z.G.). Near Wensley Grouse remained unharmed until the last week of the period, obtaining food from heather kept clear of snow by the gales; then the last heavy falls decimated them (Lord Bolton).

517. PHEASANT.—Proved able to fend for itself during prolonged frost and snow better than other game birds. A hen of the light, silvery, 'Bohemian' variety covered a brood on Eston Hills on May 27th (O.C.H.).

518. COMMON PARTRIDGE.—There were good coveys in the Wolds this year but about Wensley and Masham birds were very few indeed where usually they are plentiful.

519. RED-LEGGED PARTRIDGE.—A bird was shot on the hill above Masham in December, the first I have known there (R.C.).

520. QUAIL.—Birds were heard and seen in a number of areas—June 9th near Methley (P.B.), July 1st-9th near Masham (R.C.), near Northallerton in July (J. M. Kirk), near Boston Spa (K. M. Lewis), on Skipwith Common (B. Hanley), near Halifax (L. Broome), near Thirsk, where several were flushed in September and two shot in mid-October (B. Foggitt). A nest with eight eggs was destroyed whilst haymaking near Grassington at an altitude of 1,300 feet (K. C. Crosbie, who inspected two of the eggs). And a nest of 12 eggs was similarly destroyed near Holme, a mile from the Cheshire border at an altitude of 1,100 feet (J. Hadfield). G. A. Ewbank heard the call in the Nunthorpe area on May 5th and later received reports of bevvies, and a bird called near Hummersea on June 25th (R.S.), and near Scarborough in July. In the East Riding H. F. Woods saw two near Bridlington in spring, and birds were seen (and shot) at Warton Priory on September 24th where a bevy of 10 were put up, and at Garton (G.H.A.), and near Cottingham (E.C.), and near Driffield (E.B.B.).



## THE AUTUMN FUNGUS FORAY AT MASHAM

W. G. BRAMLEY AND JENNIE GRAINGER

THE sixty-fourth Autumn Foray of the Mycological Committee was held at Masham on October 10th-14th, 1947. Eighteen years have elapsed since the previous Foray in the area and some felling has taken place particularly at Jervaulx. Swinton Park with its rich mature woodlands and its picturesque lakes, proved so attractively mycologically that it has been decided to hold next year's Foray in the same area.

The dryness of the late summer and autumn did not provide the right conditions for large gatherings of agarics. Nevertheless some interesting additions to the county and vice-county lists were recorded, and one Hyphomycete new to Britain was turned up by Mrs. Mason at Jervaulx. *Russulas* and species of *Hygrophorus* were very few indeed, although the country worked should yield large gatherings of these species in a more normal season. The common mushroom was found in plenty in one field.

Mr. W. A. Thwaites, the Masham mycologist, was an invaluable guide. He placed his knowledge of the district at the disposal of the committee and in taking us to the most promising localities saved us much time and disappointment.

Mr. E. W. Mason gave the Chairman's Address on 'Some Common Mould,' on Saturday preceding the Annual Meeting. The thanks of the committee are due to Mr. Mason for all the help and inspiration he has accorded Yorkshire Mycology. A comparison between the 1929 list and the present one will show the extent to which the members of the Imperial Mycological Institute are adding to the knowledge of the Yorkshire fungus flora, particularly in the recording of micro-fungi.

Mr. Bramley gave the Public Lecture on 'Fungi and the Farmer,' under somewhat trying conditions, in the Town Hall, Masham, on Monday, October 13th.

## Localities

S=Swinton. M=Masham district. J=Jervaulx. H=Hackfall. Q=Quarry Ghyll. MM=Melbush wood. \*=not in Mason & Grainger V.C. 65. †=not in M. & G.

## MYXOMYCETES

- |  |  |
|--|--|
| <i>Arcyria incarnata</i> Pers. S.      | <i>Stemonitis fusca</i> Roth. H.                         |
| * <i>Cribraria rufa</i> Rost. Q.       | † <i>S. splendens</i> var. <i>webberi</i> (Rex) List. H. |
| <i>Fuligo septica</i> Gmel. S.         | <i>Trichia persimilis</i> Karst. H.                      |
| <i>Perichaena corticalis</i> Rost. S.  | <i>T. varia</i> Pers. S.H.                               |
| <i>Reticularia lycoperdon</i> Bull. S. | <i>Tubifera ferruginosa</i> Gmel. S.Q.                   |

## PHYCOMYCETES

- |  |  |
|--|--|
| * <i>Bremia lactucae</i> Regel, on <i>Senecio</i> . S.                         | <i>Mucor mucedo</i> (Linn.) Bref. S.H.             |
| <i>Plasmopara pusilla</i> (de Bary) Schroet., on <i>Geranium pratense</i> . S. | <i>Pilobolus crystallinus</i> (Wigg.) Tode. S.J.M. |

## ASCOMYCETES

## ERYSIPHALES

- |  |  |
|--|--|
| * <i>Erysiphe cichoracearum</i> DC., on <i>Arctium</i> . J.    | † <i>Microsphaera alni</i> <i>extensa</i> Salm., conidial on <i>Quercus</i> . S.J. |
| <i>E. galeopsidis</i> DC. J.                                   | <i>Podosphaera oxyacanthae</i> (DC.) de Bary, conidial on <i>Crataegus</i> . S.    |
| <i>E. polygoni</i> DC., on <i>Heracleum</i> . S.J.             | <i>Sphaerotheca pannosa</i> (Wallr.) Lév., on cultivated Rose. M.                  |
| On <i>Plantago major</i> . S. Swedes, S.J. <i>Sonchus</i> . S. | <i>Uncinula aceris</i> (DC.) Sacc. S.  |
| <i>Microsphaera grossulariae</i> (Wallr.) Lév. M.              |  |

## DISCOMYCETALES

- |  |  |
|--|--|
| <i>Ascophanus carneus</i> (Pers.) Boud. S.J.H.                           | <i>Cudoniella acicularis</i> (Bull.) Schroet. H.   |
| <i>Ascobolus stercorarius</i> (Bull.) Schroet. M.S.J.                    | * <i>Dermatea cerasi</i> (Pers.) de Not., (conidia). H.                                  |
| <i>Cenangium pulveraceum</i> (A. & S.) Fr., on <i>Fagus</i> . S.         | <i>Helotium scutula</i> (Pers.) Karst. M.  |
| * <i>Ciliaria asperior</i> (Nyl.) Boud. S.M.                             | <i>H. virgultorum</i> var. <i>fructigenum</i> (Bull.) Rehm., on <i>Fagus</i> cupules. S. |
| <i>C. scutellata</i> (Linn.) Quel. S.                                    | <i>Humaria leucoloma</i> (Hedw.) Sacc. M.  |
| <i>Coryne sarcoides</i> (Jacq.) Tul. S.H. var. <i>urnalis</i> (Nyl.). S. | † <i>Hyaloscypha dematiicola</i> (B. & Br.) Nauff. On <i>Quercus</i> chips. S.           |

## DISCOMYCETALES—continued

- Mollisia ligni* (Desm.) Karst. (M. *-Pseudopeziza trifolii* (Biv.-Bern.) Fckl.  
*lignicola* Phill.) on *Fagus* cupules. S.  
*Peziza aurantia* Pers. S. *Rhytisma acerinum* (Pers.) Fr. S.J.H.

## PYRENOMYCETALES—HYPOCREALES

- \**Calonectria ochraceopallida* (Berk. & Br.) Sacc., on *Arctium*. S.  
*Claviceps purpurea* (Fr.) Tul., abundant and fine on *Brachypodium*, *Dactylis*, *Holcus*, *Lolium*. S.J.H.  
*Cordyceps militaris* (Linn. ex Fr.) Link S.  
\**Hypocrea pulvinata* Fckl. S.H.  
*H. rufa* (Pers.) Fr., perithecia and conidia. S.  
\**Hypomyces aurantius* (Pers.) Tul., on *Polyporus*. S.  
†*H. broomeanus* Tul., on *Fomes annosus*. H.  
*Nectria cinnabarina* (Tode) Fr. S.J.H.  
*N. coccinea* (Pers.) Fr., on *Ulmus*. S.J.  
*Nectria inventa* Pethybridge (M. & G. sub *Acrostalagmus*) conidial on *Petasites*. M.  
\*N. *mammoidea* Phill. & Plowr., on *Quercus*. S.  
\*N. *punicea* (K. & S.) Fr., on *Quercus*. S.  
\*N. *sinopica* (Fr.) Fr., on *Hedera*. S.  
†*Ophionectria cerea* (Berk. & Curt.), Ellis & Everh. (Wakefield and Bisby 1941 sub *Helicosporium vegetum*), conidial on *Fagus* cupules, perithecial and conidial on wood of *Fagus*. S.

## PYRENOMYCETALES—SPHAERIALES

- †*Anthostoma microsporum* Karst., on *Alnus*. MM.  
\**A. turgidum* (Pers. ex Fr.) Nits., on *Fagus*. S.  
\**Berlesiella nigerima* (Blox. ex Curr.) Sacc., on *Diatrype stigma* on *Acer*. S.  
*Bertia moriformis* (Tode ex Fr.) de Not. S.  
†*Chaetosphaeria innumera* (Berk. & Br.) Tul., on *Acer* & *Fagus*. S.  
*C. phaeostroma* (Mont.) Fckl., on *Ilex* Q. On *Acer*, *Fagus*, *Fraxinus*. S.  
*Daldinia concentrica* (Bolt.) Ces. et de Not., on *Fraxinus*. S.H.  
†*Diaporthe arctii* (Lasch.) Nits., on *Rheum* sp. J.  
\**D. leiphaemia* (Fr.) Sacc., on *Quercus*. S.  
*Diatrype disciformis* (Hoffm.) de Not., on *Fagus*. S.  
*D. stigma* (Hoffm.) de Not., on many hosts. S.J.H.  
*Diatrypella favacea* (Fr.) Ces. et de Not., on *Alnus*. S. On *Betula*. H.  
†*Farlowiella carmichaeliana* (B. & Br.) Sacc., with *Sporocybe flexuosa*, conidial on *Alnus*, perithecial on *Prunus avium*. S.  
\**Hypoxylon coccineum* Bull., on *Fagus*. S.  
*H. multiforme* Fr., on *Alnus*. H. *Betula*. H. *Fagus*. S.  
\**H. serpens* (Pers.) Fr., on wood. S.  
\**H. rubiginosum* (Pers.) Fr., on *Fraxinus*. H.  
*Lasiosphaeria hirsuta* (Fr.) Ces. et de Not., on *Fagus* cupules. S. On wood. Q.  
*Lasiosphaeria ovina* (Pers.) Ces. et de Not., on *Sambucus*. S. On wood. Q.H.  
*L. spermoides* (Hoffm.) Ces. et de Not., on *Prunus avium*. S. On wood. H.  
†*L. strigosa* (A. & S.) Sacc., on wood. Q.  
*Leptosphaeria acuta* (M. & N.) Karst., on *Urtica*. S.  
†*L. derasa* (B. & Br.) Auersw., on *Senecio*. M.  
†*Massaria foedans* Fr., on *Ulmus*. S.  
*Melanconis stilbostoma* (Fr.) Tul., on *Betula*. H.  
†*Melanomma fusciculatum* Sacc., on *Acer*. S.  
†*Neopeckia fulcita* (Bucknall) Sacc., MM.  
†*Nummularia lutea* (A. & S.) Nits., on *Buxus*. S.  
*Ophiobolus acuminatus* (Sow.) Duby., on *Cirsium*. J.H. And *Arctium*. H.  
*O. rubellus* (Pers.) Sacc., (M. & G. sub *O. porphyrogenus*) on Umbellifer stem. J.  
*Phyllachora graminis* (Pers.) Fckl., on *Bromus racemosus*. H.  
\**Quaternaria dissepta* (Fr.) Tul., on *Ulmus*. S.  
*Rosellinia aquila* (Fr.) de Not., on *Acer*. S.  
*Ustilina deusta* (Hoffm.) Petrak. (*vulgaris*) on *Fagus*. S.H.  
*Xylaria carpophila* (Pers.) Fr., on *Fagus* cupules. S.  
*X. hypoxylon* (Linn.) Fr., S.H.  
\**X. longipes* Nits., on *Acer*. S.H.  
*X. polymorpha* (Pers.) Grev. S.  
\**Zignoella ovoidea* (Fr.) Sacc. H. On *Ulmus*. J.

## BASIDIOMYCETES

## UREDINALES

- Coleosporium petasites* Lév., II, III. M.H.  
*C. tussilaginis* Tul., III. M.H.J.  
*C. senecionis* (Pers.) Fr., II, on *S. vulgaris*. M.S.  
*Kuehneola albida* (Kuhn.) Magn., II, III, on *Rubus*. S.J.  
*Phragmidium rubi* (Pers.) Wint., III, on *Rubus*. S.  
*P. violaceum* Wint., III, on *Rubus*. J.  
*Pucciniastrum circaeae* (Schum.) Speg., II. H.  
*P. pustulatum* Diet., II, III. S.J.H.  
\**Puccinia acetosae* (Schum.) Koern., II, on *R. acetosa*. J.  
\**P. baryi* Wint., II. J.  
*P. annularis* Schlecht., III, on *Teucrium*. H.  
*P. behennis* Otth., II, on *L. dioica*. J.  
*P. centaureae* DC., III. S.H.  
*P. cirsii* Lasch., II, III, on *C. palustre*. S.  
†*P. cirsii-lanceolata* Schroet., II, III, on *C. lanceolatum*. S.  
*P. coronata* Corda, II, III, on *Festuca gigantea*. J.  
*P. graminis* Pers., III, on Oats. M.
- Puccinia lapsanae* Fekl., II, III. S.J.  
*P. lolii* Niels., II, III, on *Arrhenatherum*, *Avena sativa*, *Holcus*, *Lolium perenne*. S.H.J.  
*P. lychnidearum* Link., III, on *L. dioica*. S.  
*P. menthae* Pers., II, III, on *M. viridis*. S. M. *aquatica*. M. On *Origanum*. J. Latter new Yorkshire host.  
†*P. mirabilissima* Peck., II, III, on *Mahonia*. S.  
*P. oblegens* Tul., II, III. S.M.J.  
*P. pimpermellae* (Strauss) Mart., II, III. S.  
*P. poarum* Niels., OI. S.  
\**P. polygoni-amphibii* Pers., III. M.  
*P. saniculae* Grev., II, III. S.Q.  
*P. taraxaci* Plowr., II, III. J.  
*P. veronicae* Schroet., III, on *V. montana*. S.  
*P. violae* (Schum.) DC., III, on *V. Riviniana*. S.H.  
*Uromyces dactylidis* Otth., III. S.J.  
*U. rumicis* (Schum.) Wint. M.  
*Urocystis anemones* (Pers.) Wint., on *Ran. repens*. S.

## AGARICALES

- Amanita rubescens* (Pers.) Fr. S.  
*Lepiota cristata* (A. et S.) Fr. S.J.H.  
*Armillaria mellea* (Vahl.) Fr. S.J.H.  
*Tricholoma aggregatum* (Schaeff.) Quel. = *Clitocybe aggregata* (Schaeff.) Fr. H.  
*T. maleleucum* (Pers.) Fr. S.  
*T. rutilans* (Schaeff.) Fr. M.H.  
*T. saponaceum* Fr. S.  
\**T. virgatum* Fr. S.  
*Russula atropurpurea* (Krombh.) Maire. S.  
\**R. delicata* Fr. S.  
\**R. drimeia* Cke. M.  
*R. emetica* (Schaeff.) Fr. S.  
*R. fellea* Fr. S.  
*R. fragilis* (Pers.) Fr. S.  
*R. ochroleuca* (Pers.) Fr. S.H.  
*Mycena acicula* (Schaeff.) Fr. S.  
*M. ammoniaca* Fr. S.  
*M. filipes* (Bull.) Fr. S.J.  
*M. flavo-alba* Fr. S.  
*M. galopus* (Pers.) Fr. S.  
*M. haematopus* (Pers.) Fr. J.  
*M. lactea* (Pers.) Fr. S.  
*M. metata* Fr. S.  
*M. polygramma* (Bull.) Fr. J.  
\**M. pterigena* Fr. S.  
*M. tenerrima* Berk. S.  
*Collybia butyracea* (Fr.) Bull. S.  
\**C. cirrhata* (Schum.) Fr. S.  
*C. maculata* (A. et S.) Fr. H.
- Collybia radicata* (Relh.) Berk. S.  
*C. velutipes* (Curt.) Fr. J.  
*Marasmius harioolorum* (DC.) Quel. S.  
*Lactarius blennius* Fr. S.  
†*L. lilacinus* (Lasch.) Fr. = *spinosulus* Quel. M.  
*L. quietus* Fr. S.  
*L. subdulcis* (Pers.) Fr. S.  
*L. torminosus* (Schaeff.) Fr. H.  
*L. turpis* (Weinm.) Fr. = *L. plumbeus*. S.  
*Hygrophorus conicus* (Scop.) Fr. H.  
*H. pratensis* (Pers.) Fr. Q.  
*H. psittacinus* (Schaeff.) Fr. H.  
*Clitocybe aurantiaca* (Wulf.) Studer. S.  
*C. maxima* (Fl. Wett.) Fr. S.  
*Omphalia fibula* (Bull.) Fr. Q.  
*O. wynniae* (B. et Br.) Quel. = *Hygrophorus wynniae* B. et Br. S.  
†*Pleurotus atro-caeruleus* Fr. H.  
*P. dryinus* (Pers.) Fr. J.  
*P. ostreatus* (acq.) Fr. J.H.  
\**P. palmatus* (Bull.) Fr. J.  
*Lentinus cochleatus* (Pers.) Fr. J.  
\**Panus stipticus* (Bull.) Fr. H.  
*Pluteus cervinus* (Schaeff.) Fr. M.J.  
\**P. salicinus* (Pers.) Fr. S.  
\**Entoloma nidosum* Fr. M.H.  
*Leptonia sericella* (Fr.) Quel. S.  
*Clitopilus prunulus* (Scop.) Fr. S.  
*Pholiota aurea* (Mattusch) Fr. S.  
*P. erebia* Fr. S.J.

## AGARICALES—continued

- Pholiota mutabilis* (Schaeff.) Fr. S.H.  
*P. spectabilis* Fr. S.Q.  
*P. squarrosa* (Mull.) Fr. S.  
 \**P. subsquarrosa* Fr. Q.  
*P. togularis* (Bull.) Fr. J.  
 \**Pluteolus aleuriatus* Fr. S.  
*Inocybe geophylla* (Sow.) Fr. S.  
*Flammula lenta* (Pers.) Fr. S.  
*Hebeloma mesophaeum* Fr. M.  
*Naucoria cucumis* (Pers.) Fr. S.  
*Galera hypnorum* (Shrank.) Fr. S.  
 †*G. nana* (Petri). Pearson. S.  
*G. tenera* (Schaeff.) Fr. S.  
 \**Flammula gummosa* (Lasch.) Fr. J.  
*F. sapinea* Fr. H.  
*Cortinarius* (Myx.) *elator* Fr. S.H.  
 \**C. (Ino.) alboviolaceus* (Pers.) Fr. S.  
 \**C. (Tela.) glandicolor* Fr. M.  
 \**C. (Hydro.) decipiens* (Pers.) Fr. H.  
*Crepidotus mollis* (Schaeff.) Fr. H.  
 \**Psalliota amethystina* Quel. S.  
*P. campestris* (Linn.) Fr. H.  
*P. sylvatica* (Schaeff.) Fr. J.  
*Stropharia squamosa* (Pers.) Fr. S.J.  
*Annelaria separata* (Linn.) Karst. M.  
*Gomphidius viscidus* (Linn.) Fr. S.  
*Hypholoma fasciculare* (Huds.) Fr. J.  
*H. hydrophilum* (Bull.) Fr. S.  
*H. velutinum* (Pers.) Fr. S.J.  
*Panaeolus campanulatus* (Linn.) Fr. S.  
*Psathyrella atomata* Fr. S.J.  
*P. disseminata* (Pers.) Fr. S.J.  
 \**Psilocybe caterata* Mass. J.  
*P. semilanceata* Fr. S.  
*Coprinus atramentarius* (Bull.) Fr. S.J.  
*C. comatus* (Fl. Dan.) Fr. S.  
*C. lagopus* Fr. J.  
*C. micaceus* (Bull.) Fr. S.  
*C. plicatilis* (Curt.) Fr. S.  
*Paxillus involutus* (Batsch) Fr. H.  
*Boletus badius* Fr. S.  
*B. chrysenteron* (Bull.) Fr. S.J.H.  
*B. granulatus* (Linn.) Fr. S.  
*B. luteus* (Linn.) Fr. S.  
*B. scaber* (Bull.) Fr. H.

## APHYLLOPHORALES

- Polyporus adustus* (Willd.) Fr. S.  
*P. adiposus* B. et Br. S.H.  
*P. betulinus* (Bull.) Fr. J.  
*P. caesius* (Schrad.) Fr. S.  
*P. dryadeus* (Pers.) Fr. H.  
*P. intybaceus* Fr. S.  
 \**P. picipes* Fr. H.  
*P. radiatus* (Sow.) Fr. Q.  
*P. rutilans* (Pers.) Fr. S.  
*P. squamosus* (Huds.) Fr. S.J.  
*Fomes annosus* Fr. M.H.  
*Ganoderma applanatum* (Pers.) Pat. S.M.H.  
*Poria sanguinolenta* (A. et S.) Fr. S.  
*Polystictus versicolor* (Linn.) Fr. S.  
*Trametes mollis* (Sommerf.) Fr. S.  
*Daedalea quercina* (Linn.) Fr. H.  
*Hydnum repandum* (Linn.) Fr. S.  
*Mycoleptodon fimbriatum* (Pers.) Bourd. S.  
 \**Acia uda* (Fr.) Bourd. et Galz. S.  
*Grandinia brinkmannii* (Bres.) Bourd. et Galz. H.  
 \**Odontia papillosa* (Fr.) Bres. S.  
*Caldesiella ferruginosum* Sacc.=*C. crinalis* (Fr.) Bourd. et Galz. H.  
 \**Stereum karstenii* Bres. Q.  
*S. rugosum* (Pers.) Fr. S.  
*Hymenochaete rubiginosum* (Dicks.) Lev. H.  
*Corticium vagum* Berk. et Curt. M.  
*C. sambuci* (Pers.) Fr. S.  
*C. confuens* Fr. S.  
*C. comedens* (Nees) Fr. S.  
*C. subcoronatum* von Hoehn. et Litsch. Q.  
*Peniophora cinerea* (Fr.) Cke. S.  
 \**P. tomentella* Bres. (M. & G. sub *P. byssoidea*). S.  
 \**Clavaria aurea* (Schaeff.) Fr.  
*C. cinerea* (Bull.) Fr. S.  
 \**C. stricta* (Pers.) Fr. H.

## TREMELLALES

- Tremella mesenterica* (Retz.) Fr. H.  
 †*Sebacina* (*Bourdolia*) *caesio-cinerea* (V.H. & L.) Rogers=*Bourdolia cinerella* B. & G. Q.H.

## CALOCERALES

- Dacromyces deliquescens* (Bull.) Duby. S.  
*Calocera viscosa* (Pers.) Fr. H.  
*C. stricta* Fr. S.

## GASTEROMYCETALES

- Phallus impudicus* (Linn.) Pers. S.  
*Lycoperdon perlatum* Pers. H.  
*L. pyriforme* (Schaeff.) Pers. J.  
*Lycoperdon pyriforme* var. *excipuliforme* Desmaz. H.  
*Scleroderma aurantium* Pers. H.



## HYPHOMYCETES

- † *Atractina biseptatum* v Höhn., on wood. M.  
 \* *Arthrobotryum atrum* B. & Br., on *Fagus* cupules. S.  
*Bactridium flavum* K. & S., on wood. H.  
 † *Bactrodesmium caulicola* (Corda) Grove var. *pellucidum* Grove, on *Fagus* cupules. S.  
*Botryosporium pulchrum* Corda, on *Petasites*. M.  
 † *Brachysporium bloxhami* (Cke.) Sacc., on wood. S.  
*B. obovatum* (Berk.) Sacc., on *Prunus avium*. S.  
 \* *Cercospora mercurialis* Passer, on *Mercurialis*. S.  
*Cladosporium herbarum* (Pers.) Link, on *Arctium*, *Acer* leaves, *Cirsium*, *Urtica*. S.J.H.  
 † *Clasterosporium fasciculare* (Corda) Sacc., on *Fagus* cupules. S.  
 † *Cylindrodendrum album* Bon., on *Acer campestre* fruits, D. *Fagus* cupules, S. Wood, D.S.  
 \* *Dendryphium curtum* B. & Br., on *Urtica*. S.  
 † *Dicoccum uniseptatum* (B. & Br.) Sacc., on *Sambucus*. S.  
 † *Diplococcium spicatum* Grove, on Conifer wood. S. On wood, S.  
 \* *Fusidium viride* Grove, on *Petasites*. M.  
 \* *Gliomastix convoluta* (Harz.) Mason (M. & G. sub *Torula*), on *Typha*. S.  
 † *Haplographium bicolor* Grove, on *Quercus*. S. On wood. MM.  
 † *Helicodendrum triglitzensis* (Jaap) Linder, on *Fagus* cupules. J.  
 † *Helminthosporium longipilum* Corda, on *Betula*. MM.  
 † *H. simplex* Kunze ex Fr., on *Acer*, *Fraxinus*. S. On wood. S.MM.  
 \* *H. turbinatum* B. & Br., on *Sambucus*. S.MM. On wood. S.  
 \* *H. velutinum* Link ex Fr., on *Ulmus*. S.  
 † *Mastigosporium rubricosum* (D. & B.) Sprague, on *Dactylis*. S.  
 \* *Menispora ciliata* Corda, on *Fagus* cupules, *Sambucus* and wood. S.  
 \* *Monilia aurea* auct., on *Fagus*, Conifer wood. S.H.  
 \* *Monotospora sphaerocephala* B. & Br., on *Sambucus*. MM.  
 † *Oidium candicans* (Sacc.) Linder (= *Rhinotrichum niveum* Cke. & Mass.), on *Fomes annosus*. H. On *Quercus*. S.  
*Ovularia obliqua* (Cke.) Oudem, on *Rumex* leaves. M.  
 † *Pachnocybe clavulata* Grove, on *Sambucus*. MM.  
 † *Papularia arundinis* (Corda) Fr., on *Bambusa*. S.  
*Sepedonium chrysospermum* Fr., on *Boletus*. S.H.  
 † *Speira toruloides* Corda, on *Alnus*. MM.  
*Sporocybe flexuosa* (Mass.) Mason (M. & G. sub *Graphium*), on *Fraxinus*, *Prunus avium*, wood. S. *Alnus*. MM.  
 \* *Sporoschisma mirabile* B. & Br., on *Fagus* and wood. S.  
 \* *Stachybotrys atra* Corda, on *Petasites*. M.  
 † *Stachylidium bicolor* Link ex Fr., on *Petasites*. M.  
 \* *S. cyclosporum* Grove, on *Fagus*. S. Wood. MM.  
 \* *Stilbum erythrocephalum* Ditm., on rabbit dung. S.  
*S. tomentosum* Schrad. ex Fr. (M. & G. sub *Tilachlidium*) on *Trichia varia* S.  
 \* var. *ovalisporum* A. L. Smith, on *Trichia* sp. S.  
 † *Torula gyrosa* Cke. & Mass., on Conifer wood. M.  
*T. herbarum* (Pers.) Link, on *Heracleum*. M. *Urtica*. S.  
 † *T. hysterioides* Corda, on *Fraxinus*. S. Wood. S.MM.  
 \* *T. ovalispora* Berk., on *Fraxinus*. S.  
 † *T. ramosa* Fckl., on *Fagus*. S.  
*Trichothecium roseum* Link ex Fr., on *Quercus*. S. On *Xylaria longipes*. S.  
 \* *Triposporium elegans* Corda, on *Quercus*. S. On *Fagus* cupules. S.  
 † *Verticicladium trifidum* Preuss., on needles of *Pinus sylvestris*. S.  
 † *Verticillium apicale* B. & Br., on *Fagus* & *Quercus*. S.

We gratefully acknowledge the help in compiling this list of Messrs. E. W. Mason and S. J. Hughes (Hypho- and Pyrenomycetes), Dr. R. W. G. Dennis (Discomycetes), and Messrs. A. A. Pearson, P. H. B. Talbot and Miss E. M. Wakefield (Basidiomycetes).

## In Memoriam

HARRY DIBB

(1874-1948).

ANOTHER well-known Yorkshire naturalist has been taken from us with the passing of Mr. Harry Dibb, of Shipley, on January 12th, 1948, at the age of seventy-three. For thirty-five years he was a staunch and regular member of the Bradford Natural History and Microscopical Society and a familiar figure at Y.N.U. field meetings.

His principal contributions to the Bradford Society's meetings were his annual lectures on his Scottish mountaineering holidays, and his observations on trees and the arrivals of local migrants. He was the President of the Society in 1923, and for his presidential address carefully prepared an excellent series of lantern slides and notes on the trees of the Bradford district. During recent years he took a great interest in archaeology, and became a diligent and successful searcher for flints on Rombalds Moor.

Such was his natural modesty that probably few people realised his wide interests. He was a man of some importance in the mountaineering world, and his advice on Scottish climbs was often sought—and as readily given. In his forty years of mountain climbing he had conquered 200 Scottish peaks of over 3,000 feet, no mean feat considering the limited time available to him each year. In his belief that to keep fit for his annual mountaineering holiday he should walk at least twenty miles weekly he made it his custom on Sundays to walk over the moor to Ben Rhydding and back, being prevented only by the wildest of weather.

Mr. Dibb's knowledge of art was considerable, and he was a regular visitor to the exhibitions at the Cartwright Memorial Hall, Bradford, and at other West Riding galleries. He once said that, had circumstances permitted, he would have made art his career. As it was, he entered the textile trade and retired only last year from Messrs. Salts (Saltaire) Ltd. after over sixty years as a reliable, valued and highly-respected servant of the firm.

His quiet manner disguised his love of fun. No one had a keener appreciation of a joke than he, and in company with friends his mirth could be infectious. He was for many years a worker at St. Peter's Church, Shipley, and his Christian beliefs were practical. He gave generously, and without ostentation, to whatever cause he thought he should support.

He was a widower and leaves one son, Mr. Frank W. Dibb, well-known in art and theatrical circles in the West Riding.

S. J.

### BRITISH HERPETOLOGICAL SOCIETY

THE British Herpetological Society was formed in 1946 with the following objects:

- (a) to encourage the study of Herpetology, in particular of this country and Europe;
- (b) to publish a Journal containing papers and reviews on all aspects of Herpetology.

It is now proposed to form a Northern Branch for the convenience of interested persons who are unable to attend meetings in London, and with this in view, would anyone interested kindly communicate either with Mr. A. Leutscher (the Hon. Secretary), British Museum (Natural History), Cromwell Road, London, S.W.7, or with Mrs. A. Hazelwood, 54 Somerset Road, Bolton, Lancashire.

### PUBLICATION FUND

At the time of going to press contributions to the Publication Fund amount to £65. We gratefully acknowledge all contributions and ask those of our readers who have not yet sent their donations to support the Fund. Secretaries of Societies affiliated to the Y.N.U. are asked to bring the Fund to the notice of their Committees. Contributions should be sent (marked Publication Fund) to Miss L. M. Anderon, 48 Denton Avenue, Gledhow, Leeds, 8.

**Nature Rambles in Spring**, by Kenneth Sparrow. Pp. 104, with 14 illustrations in colour by Russell Leslie. Evans Brothers Ltd., 10/6. To judge by this book a nature ramble with Mr. Sparrow must be a depressing experience. We are told that 'a deep love of nature has been the dominating influence in his life,' but there is nothing here to indicate that it has generated any inspiration or originality. It is little more than a wearisome sequence of uninteresting and often mawkish descriptions of plants and animals and we are frankly dismayed by the threat of three more impending catalogues to cover the other seasons of the year.

## FIELD NOTES AND RECORDS

**Interglacial Moss at Dimlington, Yorkshire**—AN article under this heading in the January-March issue led the writer to ask Mr. Bisat for a specimen of the moss, which was described as a species of *Hypnum*. In his reply, Mr. Bisat stated: 'the earlier paper by Dell and myself gave a photo of the moss ( $\times 40$ ), but no attempt has yet been made so far as I know to give it a specific name. In *The Naturalist* for 1921 I recorded thicker moss-pads of *H. exannulatum* (determined by Burrell) in loam at the top of the drifts at the cement works at North Ferriby, and it may well be that the Dimlington moss is the same species. I enclose a small sample.'

This small sample was sent by me to Mr. J. B. Duncan, who has specialised on the Hypnaceae and acts as referee for the group to The British Bryological Society. In his reply Mr. Duncan stated: 'Mr. Bisat's moss is certainly *Hypnum aduncum* Hedw., one of its very numerous forms; as you know it is the most "protean" of our Harpidia.'

In view of the small size of the sample, it is not surprising that Mr. Duncan found only a single species present; but it is significant that this species is not the expected *Hypnum exannulatum*. A request for a larger sample was answered at once by Mr. Bisat, who sent me some of the interglacial clay containing the moss. After soaking in water and decanting the mud as described by W. S. Bisat and J. A. Dell in *Proc. Yorks. Geol. Soc.*, xxiv, 219, a fair quantity of moss was obtained, and all of this was sent to Mr. Duncan for examination. He reported: 'There is no doubt at all that Mr. Bisat's "fossil" moss, Sample 2, is the same as that of the first specimen (*Hypnum aduncum*) and I cannot find any trace of any other species at all. The remains are well preserved and there is no difficulty in recognising the species. It grew submerged and floating in shallow water.'

It seems advisable to publish this note now, so that local bryologists and glacial geologists may know the present position of the investigation. Much remains to be done. There is little doubt that when local geologists have explored the locality more thoroughly, many species of moss will be exposed for examination by competent bryologists. This work will throw much light upon the climatic conditions prevailing at the time when these interglacial beds were laid down. This is only one aspect of the results that may be expected. Mr. Bisat has indicated other problems which await examination by botanists, e.g. he writes: 'There is a post-glacial peat sometimes exposed on the foreshore near Dimlington (between Easington and Kilnsea) capped by marl. This might interest you, as it obviously needs examining by botanists to determine the plant remains, and needs pollen analysis to determine its age.'—G. F. HORSLEY

**A Note on the Birds of North-West Iceland**—As zoologist of the Cambridge Iceland Expedition, 1947, I was engaged chiefly in collecting Insects and Arachnids, and in making ecological notes on the Dranga Joküll area of the North-west Peninsula. It is hoped to publish the results at a later date. Meanwhile, the following observations may be worth recording separately.

MOORHEN. *Gallinula chloropus chloropus* (L.)

A solitary female was seen flying down the Joküla towards the Séla River half a mile south of the ice cap, on 7th August. The Moorhen is a rare straggler in Iceland, this being the eighth record. (*Vide* Roberts, B., 1934, *Ibis* p. 260.)

WHITE-TAILED EAGLE. *Haliaeetus albicilla albicilla* (L.)

A pair were seen in Leirufjörður on 25th August. Six pairs are reported to have bred in the North-west this year. I did not see any in Kaldalón although farmers locally told me that two pairs had bred there.

ICELAND FALCON. *Falco rusticolus islandus* Brünn.

One seen on the west coast on 29th July some 15 km. north of Reykjavík; another on 7th September just north of Akranes.

MERLIN. *Falco columbarius subaesalon* Brehm.

Common in the coastal area of the north-west. One female was seen on 13th August attacking a Golden Plover on the ground in Sklaldfannarfjall. As I was fording the swift Séla River on horseback at the time, I did not observe the strike. The Merlin left its prey with a broken right wing. Jourdain states: 'There are records of occasional captures of larger birds such as Golden Plover . . . . . ' (*The*

*Handbook of British Birds*, vol. 3, p. 23). On 3rd August, I had already found another Golden Plover with a broken right wing, near Melgraseyri.—J. L. CLOUDSLEY-THOMPSON.

**Additions to 1947 Lepidoptera Report**—THE following records have been received from A. Smith, Esq., of York, except where otherwise stated.

*Hydraecia petasitis* Double. York, larvae almost full-fed, 14, vii.

*Catocala nupta* L. Buttercrambe Village, 6, ix.

*Plusia interrogationis* L. Wass Moors, 20, vii.

*Epione paratellaria* Sch. Strensall, larvae, 14, vi; imagines, sev. at rest, 12, vii.

*Herse convolvuli* L. Wyke, Bradford, Aug., J. A. Smith.

*Cerura furcula* Clerck. Buttercrambe Woods, larvae, 17, ix.

*Nymphalis antiopa* L. Near Huggate, Scalby, ♀ in fine condition, 19, viii., C.

Brown: Hovingham, 21, ix., Mrs. Fiddler.

*Phlyctaenia ferrugalis* Hueb. Strensall Common, 31, viii.

*Pandemis cinnamomeana* Tr. Buttercrambe, 6, vii.

*Cnephasia incanana* Steph. Strensall, 4, vii.

*Eucosma turbidana* Tr. York, larvae, 15, vi.; Kirkham Abbey, imago, 25, vi.

*Bactra furfurana* Maw. Castle Howard, plentiful, 25, vi.

*Argyroplote atropunctana* Zett. Strensall Common, 15, vii.

*Enarmonia tenebrosana* Dup. Maxby, 19, vi.

*Exoteleia dodecella* L. Warthill, 16, vi.

*Aegeria formicaeformis* Esp. York, 15, vi., S. Wakely.

Comments upon the incidence of the attacks by *Apanteles glomeratus* L. (Hym.) upon *Pieris brassicae* L. come from A. C. Laughton, Esq., of Wakefield. On 8/11/47 100 yards of sandstone boundary wall at Walton Hall, near Wakefield, yielded 25 *brassicae* pupae and 1231 groups of *glomeratus* pupae; a survival rate for *brassicae* larvae of 1.99 per cent. On 9/11/47 a similar wall at Chevet Park yielded in 50 yards 105 *brassicae* pupae and 1114 groups of *glomeratus* pupae; a survival rate of 8.61 per cent. By combination these figures give the striking result of 5.25 per cent survival, ignoring the fact that many of the *brassicae* pupae may succumb to attacks by other enemies.

The nomenclature is that of Kloet and Hincks, 1945.—E. DEARING.

***Anthicus tobias* Mars. (Col. Anthicidae) in Yorkshire.**—*Anthicus tobias* Mars. was taken by me in considerable numbers on a refuse tip near Kirkburton, five miles south-east of Huddersfield, on August 13th, 1946; on September 15th, 1947, two specimens were found on the Scot Gate refuse tip, near Honley, three and a half miles south of Huddersfield. Time did not permit of a fuller investigation of this site to investigate the relative abundance, but it is probable that the species is as plentiful here as in many of its recorded stations.

These records appear to be the first for Yorkshire, and would seem to be the most northerly yet noted. This active little beetle was first captured in England in 1934 at East Malling, Kent, and the species has subsequently been recorded from Barton Moss, Lancashire; Mill Hill and Lampton, Middlesex; Ditton, Kent; Allhallows-on-Sea, Isle of Grain, N. Kent; Wood Walton, Hunts.; Gaulby, Leicestershire; Great Bookham, Surrey; Watlington, Oxfordshire; Sundon and Dunstable, Bedfordshire; and Sindlesham, near Reading, Berks.—E. W. AUBROOK.

***Niphargus fontanus* Bate (Crustacea, Gammaridae) in Hertfordshire.**—Mr. A. C. Horne, Chief Sanitary Inspector of Hemel Hempstead, gave several specimens of this species to the writer for identification. They were obtained from a well at Winkwell, near to Hemel Hempstead, Herts. (October, 1947). The writer identified them as *Niphargus* sp. and Mr. D. M. Reid kindly identified them as the above species of this genus. According to Mr. Reid it has only been recorded previously from Kent, Hampshire, Wiltshire, Berkshire, and Jersey. Dr. F. W. Jane informed the writer that specimens of the genus have been previously recorded from Hertfordshire as belonging to this species, but in view of its apparent scarcity north of the River Thames, the present authenticated capture may be worth recording.—BERNARD VERDCOURT.



## BOOK REVIEWS

**The Atlantic Islands : The Faeroe Life and Scene.** By Kenneth Williamson. Pp. 360, with pen-and-ink drawings by the author, thirty-five photographs and four maps. Collins, 16/-.

During the war troops were garrisoned in many out-of-the-way places with little or nothing to offer in the way of recreational facilities. The novelty of a new and strange environment quickly wore off and thereafter most soldiers suffered their exile with more or less acute boredom. Not so the naturalist ; to him it meant new opportunities for study, new interests and a welcome and valuable widening of experience. Mr. Williamson considered himself lucky to spend four years in the Faeroe Islands where he acquired a wife as well as the material for this book ; and his good fortune is ours, too for his account of the country and of the manner of life of the Faeroe people fills a gap in the scanty literature dealing with these islands.

Although Mr. Williamson is a naturalist specially interested in birds, his book is not intended as a guide to the natural history of the Faeroes. It is a description of a hard-living people and their daily way of life, their customs and folk lore, their farming, fishing and fowling methods, the houses they live in and the food they eat. He gave up several leaves to make excursions through the islands and wherever he went he took notes and made sketches. The result is a book packed with accurate information yet easy and at times exciting to read. Excitement is provided by the account of the hunting and slaughter of schools of caaing-whales ; a gruesome and bloody business but an economic necessity as well as a skilful and exciting sport.

Ornithologists will turn with special interest to the account of the Isle of Mykines with its great sea cliffs where live countless thousands of kittiwakes, guillemots, puffins, gannets, fulmars, razorbills, arctic terns, arctic skuas, manx shearwaters, storm petrels and Leach's fork-tailed petrels. The colonies are so vast that despite the scores of thousands of birds killed every year by the fowlers no decrease is apparent in their numbers. All the larger species are used as food, the puffins especially, and they form one of the most important natural resources of the islands. Although Mr. Williamson writes of the bird-life of these islands only in so far as it is related to the lives and economy of the people, there is a great deal of information both of interest and value to the ornithologist, and the book concludes with an appendix listing all the Faeroe birds and indicating their status. As Eric Linklater says in his foreword this is a book which 'will live for long in the affectionate knowledge of bird-lovers and island-lovers, and lovers of men's hardihood against the heavy odds of nature.'—W. A. S.

**Geology of the Country around Weymouth, Swanage, Corfe and Lulworth,** by W. J. Arkell. Pp. 386. Mem. Geol. Survey, H.M. Stationery Office, 17/6. Geological Survey Memoirs are not usually of wide appeal to the non-specialist reader, but the volume under review is not of that category. Not only does it describe in great detail the succession of Jurassic and later rocks, together with the structure of this critical region, but it presents this comprehensive record and analysis in that pleasing and fluid style familiar to readers of Dr. Arkell's other works. Dr. W. J. Arkell is not a member of the Geological Survey, but was invited to prepare this new memoir because of his authoritative knowledge of the region. He was assisted by contributions by C. W. Wright and H. J. Osborne White, and this successful collaboration has led to the production of an up-to-date volume which will undoubtedly become a classic account of a classic region. The abounding fauna of the rocks is illustrated by line diagrams of commendable clarity, as well as by plates. There is a geological map of a part of the area, so often omitted from these Memoirs. Reference is also made to the place names of the region and an appendix lists works of general interest, mostly non-geological.

Most remarkable of all is to find, in a geological work, reference to 'The Future.' Here Dr. Arkell shows profound sympathy with the social problems of the region he so ably describes. 'Few tracts of equal size could raise so many claims, scientific, aesthetic and literary, for preservation as a national park. At present, however, it seems that little could be done to save it falling piecemeal before the builder. . . . If the English of the present generation allow this heritage of the community to be irreparably spoilt for private gain they will be

held by posterity to have been unworthy to possess it. To all geologists who have enjoyed and profited by this coast, an appeal is made to do their utmost to preserve it.' All naturalists will support this sentiment.—J.E.H.

**Wild Animals and the Land**, by F. Howard Lancum. Pp. 136 with 30 photographic illustrations. Crosby Lockwood & Son, Ltd., 10/6.

The wild animals dealt with in this book are all mammals with a couple of chapters on reptiles and batrachians. It is a book written for a purpose by an experienced field naturalist. The purpose is to estimate the economic status of the species from the agriculturalists' point of view: to consider their good and bad qualities and to judge their resultant potentialities for good or ill, and also to combat prejudice and the ignorant and often unwarranted persecution to which many beneficial or harmless species are subjected. The evidence is presented in very readable accounts of each animal, punctuated by stories and reminiscences largely from the author's experience. It is written mainly for those whose work lies in the fields, the agriculturalist, horticulturalist and poultry farmer; but there is much to interest the field naturalist who, if his experience is commensurate with that of Mr. Lancum, will probably endorse the author's views about the animals he discusses. Even where there is room for disagreement Mr. Lancum's opinions command respect as they are clearly based on first-hand knowledge extending over many years of close and continuous field observations.

**A River Never Sleeps**, by Roderick Haig-Brown. Pp. 320. Collins, 12/6. This book is by a fisherman who takes his fishing seriously and loves it as an art. It is largely about fishing, but nevertheless can be read with real enjoyment by anyone. The expert fly-fisher, denied the pleasures of the rivers of British Columbia, will enjoy it to the full. Not once does the writer seek to educate his readers, yet there is much for even expert anglers to learn. Quite obviously, Haig-Brown throws a fly with consummate skill and it is easy to feel with him the sheer joy of a live rod and line. Salmon of fifty pounds and more have fallen to his rod in Columbia, but a two-pound trout in an English river provides him with an equal measure of pleasure and sense of achievement.

Mr. Haig-Brown has the gift of the artist in words; one can see with him the serene chalk streams of southern England or the vigorous young rivers of British Columbia. The country of the thousand lakes, the high peaks, the timber forests, has a glamour and a fascination that can be felt in the author's words. This is a book which will give pleasure to anyone who loves rivers and to all anglers of greater or lesser skill than the author.

The Entomological Section of the Natural History Society at Bootham School, York, has issued a duplicated typescript booklet entitled **Bootham Butterfly Records**. It is a praiseworthy example of extra-curricular educational activities. The traditions of a century of Entomological Studies are further substantiated by this 64-page booklet dealing with the history, present status and life-histories, amply illustrated by hand-coloured figures, of the species observed during the past year. The work is the result of the strenuous exertions of some seventeen students over a period of two years and they are to be complimented upon their sustained interest and skill.

The area for which records are given, incorporating the York district primarily, supported by notes from the Helmsley region, is rather wide, perhaps unduly so, for a group of schoolboys, and it might have been preferable to aim at a more concentrated investigation of the Lepidoptera *in toto* of a more restricted area. One cannot fully understand why the bibliography should be so restricted, but view the references to the 'Archives of the Entomological Section' with interest and approval. It would have been most interesting to learn of more personal practical work carried out by the group than is evidenced by the scanty references to the rearing of insects. The impression that the booklet has been compiled from two sources only, the library and occasional excursions in the field, is difficult to avoid, so scanty are the original remarks. Probably the omission of the paragraphs dealing with life history would not have impaired the value, and a few illustrations from actual specimens, *e.g.* the dark variety of *Argynnis aglaja*, would have enhanced the appearance of the work.—E. DEARING.

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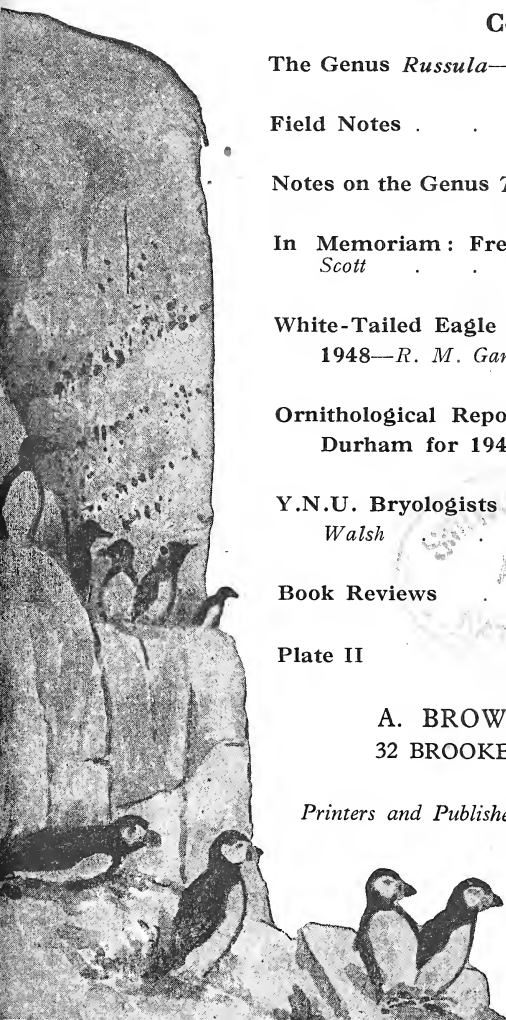
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THE Committee desire to have the autumnal (end July to mid November) migration period covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges will continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods of a week or longer please agree their periods with the Hon. Secretaries as early as convenient, giving if possible, alternative dates and periods? If this is done it will help those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period occupation, week-end residence, etc., can then be arranged for other helpers who should also apply early. In 1947, visits at short notice were often difficult to arrange and are likely to become more so. With five occupants the cottage is considered full.

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*Hon. Secretaries.*

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Copies of Mr. A. A. Pearson's 'Notes on the Boleti' (price 1/-) and 'The genus Russula' (price 2/-) may be obtained, post free, from The Editor of *The Naturalist*.

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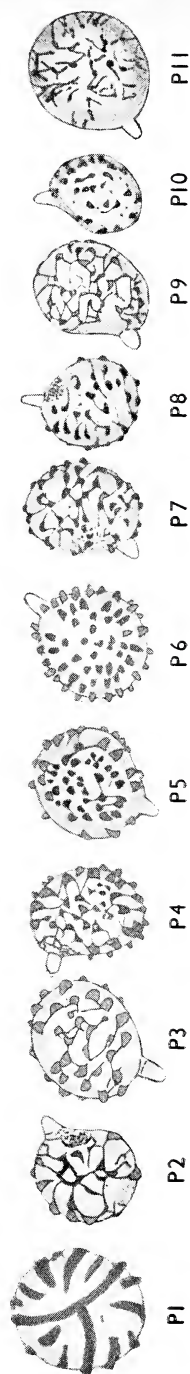
# THE GENUS "RUSSULA"

COLOUR OF SPORE DEPOSITS IN MASS



A B C D E F G H

TYPES OF SPORE ORNAMENTATION



THE GENUS *RUSSULA*

A. A. PEARSON, F.L.S.

No fungi are more prominent in our woods than those belonging to the two genera *Lactarius* and *Russula*. These large and often beautifully coloured agarics ought to be the easiest to name; at least one would think so. They form a group quite distinct from any other. Their only close relatives are found in a small group of underground fungi which have echinulate spores that stain blue with iodine and tissue containing globose cells (spherocysts) which are a striking feature of all the species of *Lactarius* and *Russula*.

The chief difference between these two genera is the presence of a milky fluid in the gills of all *Lactarii*; when cut or wounded, the fluid gushes out, often in abundance, sometimes very sparsely and less milk-like. Lactiferous cells are also present in some if not all the species of *Russula*, but there is no visible flow of milky juice. With the exception of a few minor problems chiefly associated with the *subdulcis* group, it has always been possible to determine the British species of *Lactarius* without much difficulty. This can hardly be said of *Russula* species. It is only in recent years that this genus has been intensively studied. In 1910 René Maire could write that in the whole of mycology there was no genus in a greater muddle. Since then much of the confusion has been cleared up, though we cannot say that there are no more problems left to settle. We do, however, know a great deal about the European species. This is due to several modern authors. The pioneer was René Maire who in 1908 and 1910 wrote papers in the *Bulletin de la Société Mycologique de France* on the classification of the genus *Russula*. He shewed us how to tackle the subject, not indeed by abandoning the methods of the old authors, but by supplementing their observations with microscopic examination of the spores and cystidia, using suitable stains for this purpose. Colour reactions to certain chemicals were also found to be of some importance.

Some years afterwards a succession of monographs appeared. Here is a list:

- 1926. Rolf Singer. *Monographie der Gattung Russula*.
- 1926. Jakob E. Lange. Studies in the Agarics of Denmark. Part VI including *Russula*.
- 1927. Melzer and Zvara. *Ceske Holubunky*. A monograph in Czech, with a key to species in French.
- 1930. C. Crawshaw. The spore ornamentation of *Russula* (with a key to species).
- 1932. Rolf Singer. A revised edition of his 1926 work.
- 1932-4. Julius Schaeffer. *Russula Monographie*.
- 1940. Jakob E. Lange. *Flora Agaricina Danica*, Vol. V, including coloured plates.

Each of these authors contributed something of value. Unfortunately they often disagree and in more recent work there is a tendency unduly to multiply species and varieties. These need not be discussed in the present paper, the purpose of which is to give short descriptions of all species fully authenticated as British and to supply a key which will enable students to run down their specimens with a reasonable amount of certainty. Such keys are called for, though they are not without danger. When you think you have run your specimen to earth, it must be carefully compared with the description. After all, you may have found something new or not in the list. What is more likely is that you have gathered a form which does not fit the description perfectly. The *Russulae*, like other fungi, are plastic bodies, very sensitive to the influence of soil and weather. Unusual variations must occur. Only a long experience makes it possible to recognise a species in all its disguises. The key is based on the usual colouration of a normal adult specimen, but rain, frost and sun, not to speak of extreme youth and old age, may play strange tricks with colour. Some factor in the soil may also have disconcerting effects.

In most cases it will be found that the key will function without using the microscope, but not always. Spore ornamentation is a very useful character and sometimes decisive. For most agarics it is not necessary to use oil immersion in examining spores under the microscope but for *Russula* it is indispensable. Looked at with a low or moderate magnification all *Russula* spores look much the same, the only difference being that some have longer spines or warts than others. But

when observed with stronger lenses and oil immersion, the spores are found to have remarkably complicated surface markings, some with isolated spines, others with thin connecting lines between the spines or warts forming in many cases a network. There are also spores with thick ridges or crests. All these are clearly defined when seen under a magnification of about 1500. With half this, most of the detail is visible, only a few very thin lines not coming into view. The technique required is not difficult and is dealt with below.

Our list contains 66 species and 15 varieties or forms. A few more will be added in future years. Another score or so of authentic species have been described in Europe, and many doubtful ones. Some of these require a warmer climate. There are vast numbers to be found outside Europe. The genus *Russula* is widely spread over the earth's surface, from the arctic regions to the equator. It would appear to be well adapted to the tropics, where many species have been collected in recent years, some with a ring on the stem.

Most of the mild species of *Russula* found in Europe are edible and some of the acid ones too. So far as we know, there are no poisonous species or at least not dangerous to man, though doubtless many would be found not to have qualities that would find favour with the keenest of mycophagists.

Modern authors have proposed various changes in the method of grouping species of *Russula*. Those here have been placed in sections to include closely-allied species so far as possible except in the *sub-acrae* group which is rather a mixed lot. This is not of great importance. Living organisms cannot always be docketed in a rigid manner. The diagnostic characters of *Russula* are: compactness, colour of cap, stem and gills, taste, smell, colour of spores in mass (spore powder), ornamentation of spores, presence of cystidia in gills and cap, colour changes of flesh when exposed to the air or to various chemical substances. All these can be described in words, but there is always something peculiar about an agaric which no words can faithfully convey. That is why a wide experience in the field is necessary. Photographs are of some value but not until they accurately reproduce the colours will they be really helpful. Good water-colour figures are the best, but even these cannot shew the peculiar surface qualities which may serve to distinguish a species.

*Taste and Smell.*—The first thing to do when running down a *Russula* is to find out whether it is mild, peppery or bitter. Take a small piece and chew it well; tongues differ in their sensitiveness. Some species have mild flesh and acid gills, so these should be tasted separately. Smell, too, is important but smell perceptions are even more varied, so it is a very unreliable diagnostic feature. One example may be given: some people detect the crab or fishy smell of *R. xerampelina* at once; others not at all. Experts in odour find subtle smells in most species of *Russula* but most of us are completely baffled.

*Spore Powder.*—The next step is to ascertain the exact colour of the spores in mass. A shallow spore deposit will look very different from a thick one, so it is necessary to scrape the powder into a small heap, press it down and compare with a colour-chart. A special chart for spore colour was provided by Crawshay in the book cited above. To each colour a letter was given and most modern authors have adopted this as standard. So far as it is possible to reproduce colours exactly, they will be found on the attached plate. Colour E has been modified as this was not quite right on the original scale. The colours are those of fresh deposits as the colour may change with age especially the white, which after a time turns buff. The gills give some indication of the spore colour but can be very deceptive. On a young specimen they are usually paler than when mature. As the spores develop, the gills deepen in colour in the species with creamy or ochraceous spores, but do not always attain to so deep a shade as the spores in mass.

*Spores.*—The spores of all the *Russulae* are amyloid: they turn dark blue in iodine or to be more exact, the armature or raised pattern on the spore surface is coloured by the iodine. The apiculus is not affected and remains colourless and barely visible. The spores of a few *Russulae* are so uniquely characteristic that they alone would enable the species to be identified, but that happens in very few cases. Some authors might claim that there is something individual in the spores of each separate species, but most of us feel that this can hardly be substantiated. It is sufficient to adopt the method introduced by Singer and refer to the spores under type numbers. We are fortunate in being allowed to reproduce some spore



drawings extracted from Crawshaw's book and have attached to each a type number. All spores vary within certain limits and therefore the figures though drawn from an actual spore, can only be an approximation when referred to as a type.

One small point easily overlooked by the amateur can be mentioned: when a suitable objective lens of high magnification (+100) is used, the very thinnest cover slip is necessary (No. 1); otherwise the lens will touch the glass before the spores come into focus.

Various iodine solutions have been proposed. The most widely used is the chloral-iodine mixture first introduced by Melzer; his own formula is as follows:

Iodide of potassium	1.5 gr.	} Mix with an equal quantity of chloral - hydrate.
Iodine	0.5 "	
Distilled water	20.0 "	

E. J. Gilbert prefers a solution containing much less iodine which can be recommended:

Iodide of potassium	0.50 gr.
Iodine	0.05 "
Distilled water	10.00 "
Chloral Hydrate	10.00 "

Iodine solutions will keep for a long time.

*Cystidia*.—These grow on the gill edge, sometimes also on the face of the gill and less frequently on the surface of the cap. They are best observed in sulphovanillin (SV) which is made up as follows:

Vanilla crystals	1 grain.
Sulphuric acid	8 ccm.
Distilled water	2 to 4 ccm.

That is what we are told, but careful mixtures are not necessary. A few vanilla crystals on a watch glass or in a bottle with enough sulphuric acid to dissolve them is good enough. A glass rod is required to stir the solution which will keep a few days without emulsifying; it must however be frequently renewed, so very small quantities are made. When the gill is examined in SV, fusoid or cylindrical cells stand out usually stained blue-black either throughout or in part. Less frequently the cystidia stain red or not at all. Similar cells which also stain sometimes occur in the cuticle of the cap; they are usually more slender and their shape is fish-like with a long tail. Long worm-like hyphae also appear in the cap of some species. All these have a value but we do not know if they are stable enough to be of diagnostic importance. (High-powered lenses and oil immersion are not required for these observations.)

*Chemical Reactions*.—Various chemical substances have been used for producing colour changes on the stem, gills and flesh of the *Russulae*. The most important is Green Vitriol or Iron Sulphate ( $\text{FeSO}_4$ ). In solid form it can be carried in the pocket for use in the field. Its chief value perhaps is to distinguish *Russula xerampelina* from all the other species with deep coloured spore powder. This *Russula* occurs in many forms and before the introduction of Iron Sulphate by Melzer, it was a baffling species. The quick green reaction when  $\text{FeSO}_4$  is applied to any part of the fruit body, is a diagnostic feature that never fails. When used on *R. cyanoxantha* there is no immediate colour change. In most species the reaction is flesh pink.

In this paper other chemical reactions are rarely stated, but they can be obtained from the work which the veteran French mycologist, F. Bataille, completed before his recent death. This work gives a wide range of macrochemical reactions on the basidiomycetes including the *Russulae*, and it has just been published as a supplement to Vol. LXIII (1948) of the *Bull. Soc. Myc. Fr.*

*Descriptions*.—Much detail has been omitted as unessential. It is hardly necessary to state that the cap is convex, then expanded and finally depressed because that happens to all the *Russulae*. The margin of most species is smooth at first, then striate or sulcate but sometimes this latter feature is specially marked. The shape of the stem is sometimes of value but not often. Colour varies enormously though it is a safe guide to typical examples, but to put in all the colour gradations would only lead to confusion.

**Abbreviations.**—Very few are used in the descriptive part (*fin.* for finally; *sm.* for smell; *sl.* for slightly), but for the chemical reactions and the microscopic details they are always used:

Fe=Iron sulphate (FeSO<sub>4</sub>).

SV=Sulpho-vanillin.

The letters A to H refer to the chart for spore colours.

The measurements of the spores are in microns ( $\frac{1}{1000}$  of a millimetre).

The numbers P1 to P11 refer to the types shewn in the spore chart.

It is not without diffidence that this small work is issued. Though it deals with only one group of the agarics, the approach to the study of the *Russulae* is far from easy. If a little patience is exercised, a knowledge of the species will come gradually. Beginners must not expect to name everything at once, but the author hopes that this short monograph will put them on the right track, so that after a few collecting seasons their teething troubles will end, though there will always be critical species to puzzle them. Were it otherwise they would no longer find the subject worth pursuing. However, there is no finality in mycological study and least of all in the genus *Russula*.

### Key to Species of *Russula*

- |     |  |     |     |     |     |     |     |   |    |
|-----|--|-----|-----|-----|-----|-----|-----|---|----|
| 1.  | Cap white at first   | ... | ... | ... | ... | ... | ... | ...   | 2  |
|     | Cap green  | ... | ... | ... | ... | ... | ... | ...   | 7  |
|     | Cap yellow   | ... | ... | ... | ... | ... | ... | ...   | 13 |
|     | Cap buff, ochre, ivory yellow or straw colour                                    | ... | ... | ... | ... | ... | ... | ...   | 18 |
|     | Cap brown or brownish  | ... | ... | ... | ... | ... | ... | ...   | 24 |
|     | Cap violaceous or lilaceous, often mixed colours                                 | ... | ... | ... | ... | ... | ... | ...   | 29 |
|     | Cap apricot, peach or orange   | ... | ... | ... | ... | ... | ... | ...   | 34 |
|     | Cap red, crimson or with some red or pink  | ... | ... | ... | ... | ... | ... | ...   | 36 |
|     | Cap creamy in centre, reddish or brownish margin                                 | ... | ... | ... | ... | ... | ... | ...   | 63 |
| 2.  | Cap tomentose ( <i>sub lente</i> ) gills often bluish-green especially near stem |     |     |     |     |     |     |   |    |
|     |  |     |     |     |     |     |     | <i>R. delica</i> (1)                              |    |
|     | Not so   | ... | ... | ... | ... | ... | ... | ...   | 3  |
| 3.  | Cap smooth, dingy white, flesh turns black                                       | ... | ... | ... | ... | ... | ... | ...   | 4  |
|     | Not turning black: white forms of 8, 13, 33, 39, 40.                             |     |     |     |     |     |     |   |    |
| 4.  | Gills very thick and distant; flesh turns red, then black.                       |     |     |     |     |     |     | <i>R. nigricans</i> (2)                           |    |
|     | Gills normal   | ... | ... | ... | ... | ... | ... | ...   | 5  |
| 5.  | Flesh turns red, then black  | ... | ... | ... | ... | ... | ... | <i>R. densifolia</i> (3)                          |    |
|     | Not turning conspicuously red when cut   | ... | ... | ... | ... | ... | ... | ...   | 6  |
| 6.  | Flesh turns quickly brown or black   | ... | ... | ... | ... | ... | ... | <i>R. albo-nigra</i> (5)                          |    |
|     | Flesh turns greyish brown and slowly black                                       | ... | ... | ... | ... | ... | ... | <i>R. adusta</i> (4)                              |    |
| 7.  | Taste mild   | ... | ... | ... | ... | ... | ... | ...   | 8  |
|     | Taste acrid  | ... | ... | ... | ... | ... | ... | ...   | 12 |
| 8.  | Gills and spores white   | ... | ... | ... | ... | ... | ... | ...   | 9  |
|     | Gills and spores cream or yellow   | ... | ... | ... | ... | ... | ... | ...   | 11 |
| 9.  | Cap verdigris green, cracking all over, usually starting from margin             |     |     |     |     |     |     | <i>R. virescens</i> (7)                           |    |
|     | No so  | ... | ... | ... | ... | ... | ... | ...   | 10 |
| 10. | Gills subdecurrent. Reaction to Fe: salmon.                                      | ... | ... | ... | ... | ... | ... | <i>R. heterophylla</i> (13)                       |    |
|     | Gills adnexed. No immediate colour reaction to Fe:                               |     |     |     |     |     |     |   |    |
|     |  |     |     |     |     |     |     | <i>R. cyanoxantha</i> green form (12)             |    |
| 11. | Gills and spores pale cream  | ... | ... | ... | ... | ... | ... | <i>R. aeruginosa</i> (45)                         |    |
|     | Gills and spores egg yellow  | ... | ... | ... | ... | ... | ... | <i>R. olivacea</i> (54)                           |    |
|     | Gills and spores ochre   | ... | ... | ... | ... | ... | ... | <i>R. xerampelina</i> var. <i>olivascens</i> (52) |    |
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|     | Spores egg yellow  | ... | ... | ... | ... | ... | ... | <i>R. luteo-viridans</i> (36)                     |    |
| 13. | Taste mild   | ... | ... | ... | ... | ... | ... | ...   | 14 |
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| 14. | Small size   | ... | ... | ... | ... | ... | ... | ...   | 15 |
|     | Medium or large size   | ... | ... | ... | ... | ... | ... | ...   | 16 |

15. Cap and gills egg yellow ... .. *R. lutea* (63)  
 Cap greenish lemon ; gills and spores white ... *R. smaragdina* (24)
16. Cap velvety; often with flush of violet on stem ... *R. amoena* (11)  
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17. Gills deep cream, spores ochre, all parts turn black *R. claroflava* (50)  
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 Cap pale tan or toast brown, spores cream, margin sulcate, smell unpleasant ... *R. pectinata* (18)  
 Cap ochraceous or yellow ; inodorous ... *R. ochroleuca* (22)
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22. Large size, smell unpleasant, spores with large warts *R. foetens* (16)  
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 Taste acrid ... .. 26
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- |     |   |     |     |     |     |     |   |    |
|-----|---|-----|-----|-----|-----|-----|---|----|
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| 38. | Cap blood red or paler, velvety or powdery ; stem often flushed red ; taste mild or sl. bitter  | ... | ... | ... | ... | ... | <i>R. lepida</i> (8)                              |    |
|     | taste very bitter   | ... | ... | ... | ... | ... | <i>R. lepida</i> var. <i>amara</i> (8)            |    |
|     | Not so  | ... | ... | ... | ... | ... | ...   | 39 |
| 39. | Cap pink and cream ; stem white ; reaction to SV : carmine red                                  | ... | ... | ... | ... | ... | <i>R. rosea</i> (9)                               |    |
|     | Not so  | ... | ... | ... | ... | ... | ...   | 40 |
| 40. | Cap flesh pink, pinkish-buff or dingy pale brown. Cuticle not quite reaching margin             | ... | ... | ... | ... | ... | <i>R. vesca</i> (14)                              |    |
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|     | The same but with slight green tint in centre.  | ... | ... | ... | ... | ... | <i>R. fallax</i> (27)                             |    |
|     | Cap dark purplish-red with black centre, firm, sl. acrid or mild.                               | ... | ... | ... | ... | ... | <i>R. atro-purpurea</i> (37)                      |    |
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|     | Lilaceous flesh-pink flushed brownish ; whole fungus acquires flush of wax-yellow ; small size  | ... | ... | ... | ... | ... | <i>R. puellaris</i> (47)                          |    |
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- |     |   |                           |    |
|-----|---|---------------------------|----|
| 55. | Dull or brownish-red ; spores with isolated warts   | <i>R. integra</i> (57)    |    |
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|     | Pink with white patches or white with pink margin, satiny ; stem white or grey ; under birch  | <i>R. exalbicans</i> (40) |    |
|     | Reddish or pink ; margin pectinate ; stem white clavate usually with pink flush ; fragile, in damp places under birch often in <i>Sphagnum</i>                              | <i>R. venosa</i> (64)     |    |
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|     | Pink or creamy with pink flush, deeper red or pink at margin  | <i>R. veternosa</i> (35)  |    |
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SPECIES	CAP	GILLS	STEM
<b>I. LACTARIOIDES</b>			
1. <i>delica</i> Fr.	5-8 cm. white turns light or rusty brown or spotted, dry, tomentose-arachnoid then smooth, hardly peeling; margin acute, not striate	crowded, narrow, linear, white oft. bluish near stem, decurrent	3-6 × 2-6 cm. white or brownish bluish at base, hard
2. <i>nigricans</i> (Bull.) Fr.	10-20 cm. dirty white to sepia-brown or black, dry, matt, naked, peels abt. $\frac{1}{3}$ ; margin rather thin, smooth	very distant, thick, brittle, straw colour to olive, turns red to touch, adnate	3-8 × 1 $\frac{1}{4}$ -4 cm. white to brownish smooth, hard
3. <i>densifolia</i> (Secr.) Gill.	7-15 cm. white or cream, dingy brown in centre and fin. black, sl. viscid; margin thin, felty or veined	crowded, narrow, thinner than above, linear, white, red to touch, subdecurrent	3-5 × 1-2 cm. white, red to touch, smooth, firm
4. <i>adusta</i> Fr.	8-15 cm. whitish then greyish-brown fin. black; naked, smooth, sl. viscid; margin thin, smooth	crowded, thin, narrow, white turns black, subdecurrent	3-5 × 2-3 cm. white to brownish naked, smooth, hard
5. <i>albo-nigra</i> (Krombh.) Fr.	8-15 cm. dirty white but quickly brown or black; viscid; margin thin, smooth	crowded, thin, narrow, white, edge blackens, decurrent	3-5 × 1 $\frac{1}{4}$ -3 cm. white, soon black, floccose or alveolate, reticulate, so
<b>II. RIGIDAE</b>			
6. <i>mustelina</i> Fr.	5-10 cm. clay brown, radially veined, sl. viscid, greasy, shining, $\frac{1}{3}$ peeling, margin thin, seldom sulcate; hard	subcrowded, white to cream, oft. with brown spots, adnate-sinuate with decurrent tooth	4-6 × 1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm. white then brownish rugulose, hard
7. <i>virescens</i> (Schaeff.) Fr.	6-15 cm. light or dark verdigris green; scurfy soon cracking especially at margin which is blunt, smooth then sulcate; hard	subcrowded, white or pale cream, narrow, adnexed	4-9 × 2-5 cm. white, rugulose, solid, firm
8. <i>lepida</i> Fr.	5-10 cm. blood red or paler with velvety-pulverulent surface, not peeling, hard; margin smooth	subcrowded, whitish or pale cream, edge often red near margin, adnexed	3-6 × 1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm. white or flushed solid, hard
var. <i>amara</i> Maire.	differs in the very bitter taste		
var. <i>lactea</i> (Pers.) Fr.	differs in the white pileus		
9. <i>rosea</i> Quel.	6-7 cm. pink and cream, matt. peeling $\frac{1}{3}$ way, margin incurved at first, smooth	crowded, white, adnexed or free, forked, near stem	4-5 × 1-1 $\frac{1}{2}$ cm. white, firm, rugulose
forma <i>aurora</i> Pearson	differs in colour of cap being creamy-yellow or with all the tints of a ripe peach		

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
te, hangeable	mild in stem, acrid in gills; sm. faint dis- tinctive	B 9-12×8-10 P4	SV: blue	Fe: almost nil at first, then salmon. SV: blue-black	mixed woods; common
te, turns red, black	mild or acrid when young; sm. faint	white 7-8×5-6 P9	SV: blue	Fe: olive green	mixed; common
te, turns red, black	gills acrid, stem mild; sm. faint	white 8-9×6-7 P9	SV: blue	Fe: olive green	mixed; uncom- mon
r white, turns ey-brown d slowly ack	mild; sm. strong	white 8×7 P9	SV: pink or bluish	Fe: flesh pink, but finally dirty olive	mixed; common
te, immedi- ely turns ack	rather bitter; sm. faint	white 7-8×7 P9	SV: pink or bluish	Fe: flesh pink, but soon olive-brown on gills	mixed; uncom- mon
ite or dingy brown	mild; no sm.	B—D 8-9×6-8 P9	SV: blue, none in cap	Fe: flesh pink	conifers; uncom- mon
ite, spongy a stem	mild; sm. fishy when old	B 8-10×7-8 P9	sparse, SV: not colouring or faint blue	Fe: pale salmon	deciduous woods esp. beech; common
te	mild or sl. bitter	B 8-9×6-7 P4	SV: not blue	Fe: dull orange or rusty. SV: dingy violet	deciduous wood esp. beech; uncommon  rare  rare
te	mild; sm. none	B 8×6½ P8	sparse, not blue with SV. none in cap	Fe: salmon. SV: brilliant carmine red	leafy woods; common
"	"	"	"		uncommon





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>I. LACTARIOIDES</b>									
1. <i>delica</i> Fr.	5-8 cm. white turns light or rusty brown or spotted, dry, tomentose-arachnoid then smooth, hardly peeling; margin acute, not striate	crowded, narrow, linear, white oft. bluish near stem, decurrent	3-6 × 2-6 cm. white or brownish bluish at apex, hard	white, changeable	mild in stem, acid in gills; sm. faint distinctive	B 9-12 × 8-10 P4	SV: blue	Fe: almost nil at first, then salmon. SV: blue-black	mixed woods; common
2. <i>nigricans</i> (Bull.) Fr.	10-20 cm. dirty white to sepia-brown or black, dry, matt, naked, peels abt. $\frac{1}{2}$ ; margin rather thin, smooth	very distant, thick, brittle, straw colour to olive, turns red to touch, adnate	3-8 × 1-4 cm. white to brown smooth, hard	white, turns red, fr. black	mild or acid when young; sm. faint	white 7-8 × 6-6 P9	SV: blue	Fe: olive green	mixed; common
3. <i>densifolia</i> (Secr.) Gill.	7-15 cm. white or cream, dingy brown in centre and fin. black, sl. viscid; margin thin, felty or veined	crowded, narrow, thinner than above, linear, white, red to touch, subdecurrent	3-5 × 1-2 cm. white, red to touch, smooth, firm	white, turns red, fr. black	gills acid, stem mild; sm. faint	white 8-9 × 6-7 P9	SV: blue	Fe: olive green	mixed; uncommon
4. <i>adusta</i> Fr.	8-15 cm. whitish then greyish-brown fin. black; naked, smooth, sl. viscid; margin thin, smooth	crowded, thin, narrow, white turns black, subdecurrent	3-5 × 2-3 cm. white to brown naked, smooth, hard	grey white, turns grey-brown and slowly black	mild; sm. strong	white 8 × 7 P9	SV: pink or bluish	Fe: flesh pink, but finally dirty olive	mixed; common
5. <i>albo-nigra</i> (Krombh.) Fr.	8-15 cm. dirty white but quickly brown or black; viscid; margin thin, smooth	crowded, thin, narrow, white, edge blackens, decurrent	3-5 × 1-3 cm. white, soon black floccose or almost reticulate, solid	white, immediately turns black	rather bitter; sm. faint	white 7-8 × 7 P9	SV: pink or bluish	Fe: flesh pink, but soon olive-brown on gills	mixed; uncommon
<b>II. RIGIDAE</b>									
6. <i>mustelina</i> Fr.	5-10 cm. clay brown, radially veined, sl. viscid, greasy, shining, $\frac{1}{2}$ peeling, margin thin, seldom sulcate; hard	subcrowded, white to cream, oft. with brown spots, adnate-sinuate with decurrent tooth	4-6 × 1-2 cm. white then brown rugulose, hard	white or dingy brown	mild; no sm.	B-D 8-9 × 6-8 P9	SV: blue, none in cap	Fe: flesh pink	conifers; uncommon
7. <i>virescens</i> (Schaeff.) Fr.	6-15 cm. light or dark verdigris green; scurfy soon cracking especially at margin which is blunt, smooth then sulcate; hard	subcrowded, white or pale cream, narrow, adnexed	4-9 × 2-5 cm. white, rugulose solid, firm	white, spongy in stem	mild; sm. fishy when old	B 8-10 × 7-8 P9	sparse, SV: not colouring or faint blue	Fe: pale salmon	deciduous woods esp. beech; common
8. <i>lepida</i> Fr.	5-10 cm. blood red or paler with velvety-pulverulent surface, not peeling, hard; margin smooth	subcrowded, whitish or pale cream, edge often red near margin, adnexed	3-6 × 1-2 cm. white or flushed red solid, hard	white	mild or sl. bitter	B 8-9 × 6-7 P4	SV: not blue	Fe: dull orange or rusty. SV: dingy violet	deciduous wood esp. beech; uncommon
var. <i>amara</i> Maire.	differs in the very bitter taste								rare
var. <i>lactea</i> (Pers.) Fr.	differs in the white pileus								rare
9. <i>rasea</i> Quel.	6-7 cm. pink and cream, matt. peeling $\frac{1}{2}$ way, margin incurved at first, smooth	crowded, white, adnexed or free, forked near stem	4-5 × 1-1 cm. white, firm, rugulose	white	mild; sm. none	B 8 × 6 $\frac{1}{2}$ P8	sparse, not blue with SV. none in cap	Fe: salmon. SV: brilliant carmine red	leafy woods; common
forma <i>aurora</i> Pearson	differs in colour of cap being creamy-yellow or with all the tints of a ripe peach	"	"	"	"	"	"	"	uncommon

SPECIES	CAP	GILLS	STEM
<b>II. RIGIDAE—cont.</b>			
<b>10. azurea</b> Bres.	3-6 cm. mixed blue, lilac and grey, sl. greasy then scurfy with white flocci or granules; peels easily; margin rounded	crowded, chalk white, forked near stem	3.5×1-2 cm white, rugulose
<b>11. amoena</b> Quel.	4-8 cm. lemon or flushed violet or all colours of rainbow, viscid or dry, velvety-pulverulent, hard, not peeling; margin smooth, when old sulcate	crowded, whitish to cream, edge sometimes purplish, floccose	3.5×1-2 cm white, lemon or violet, often biconic; hard pruinose
<b>III. RESILIENTES</b>			
<b>12. cyanoxantha</b> (Schaeff.) Fr.	5-15 cm. mixed lilac, purplish or dark green, seldom one colour only; greasy, shining, radially veined, $\frac{1}{2}$ peeling; margin thin, smooth, when old striate	subcrowded, white, rather narrow, adnexed, softly elastic with oily feel when stroked	5-10×1-3 cm white, sometimes flushed purple, almost equal
<b>13. heterophylla</b> Fr.	5-8 cm. green to brown with no red or purple tints, smooth, $\frac{1}{2}$ peeling; margin thin, striate only when old	crowded, narrow, white, edge sometimes with rusty spots, subelastic when stroked; subdecurent	3-6×2-3 cm white, rusty base, equal or pointed
var. <i>virginica</i> Cke. & Mass.	Same as above but pure white	"	"
<b>14. vesca</b> Fr.	6-10 cm. often umbilicate, flesh-pink or dingy buff (livid brown), sl. viscid, smooth, $\frac{1}{2}$ peeling, cuticle often short of margin showing white flesh; faintly striate	crowded, narrow, white, resilient, sometimes beaded with drops staining edge rusty brown; subdecurent	2.5×1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm white, rusty at base, typically pointed, sometimes equal
<b>15. farinipes</b> Romell	3-5 cm. flat or depressed, light straw or ivory yellow with rusty brown spots; hardly peeling, margin striate then sulcate; elastic	crowded or subdistant, almost white then pallid, thin, narrow, often weeping, adnate or subdecurent, elastic	2-4×1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm white or rusty patches, equal pointed, elastic
<b>IV. FOETENTES</b>			
<b>16. foetens</b> Fr.	8-15 cm. usually large, dingy brownish ochre or honey colour, glutinous at first then glabrous with fine radial veins. Margin thin, pectinate tubercular	subcrowded, whitish, oft. with brown spots, narrow, often weeping	5-9×1 $\frac{1}{2}$ -3 cm white or pale brown, rind hard, soft inside
<b>17. lauro-cerasi</b> Melzer	Very like above, but smaller and margin less grossly sulcate; differs chiefly in the remarkable spore	"	"
<b>18. pectinata</b> (Bull.) Fr.	2-7 cm. pale tan or toast brown, sometimes with rusty spots; viscid, peels to disc; closely pectinate and tubercular at thin margin	crowded, pallid, adnexed, narrow or broad, shape variable	2.5×1-2 cm. white or rusty stained, smooth or rugulose, rat soft

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
white, soft	mild; no sm.	A 8-10×7-8 P8	abundant, SV: not usually blue, none in cap		conifers; uncommon
white or rusty towards base	mild; sm. peculiar when old	B—C 7-9×7-8 P2	sparse, SV: not blue		mixed woods
white	mild; inodorous	A 8-9×6½-7 P10	sparse, SV: half blue, none in cap	Fe: none or very slowly olive	leafy woods; common
white or rusty at base	mild; inodorous	A 6-7×5-6 or pyriform about 10×6 P10	sparse, SV: part blue, none in cap	Fe: flesh pink	leafy woods; common
"	"	"	"	"	uncommon
white, turns rusty or honey colour	mild and nutty, inodorous	A 6-8×5-6 P10	sparse, SV: part blue, none in cap	Fe: salmon	leafy woods, esp. oak; common
white	peppery, inodorous	A 7-8×6-7 P10	abundant, SV: blue		leafy woods; fairly common
white or dirty brown	bitter and peppery, strong oily smell	B—C 8-10×8-9 P5—6	abundant, SV: blue, none in cap	Fe: flesh pink	mixed woods; common
"	strong smell of bitter almonds	B—C 10-14 P1	"	"	beech woods
white	mild; sm. rather oily	D 8-9×5½-6 P2	SV: blue, none in cap		under oaks; fairly common





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>II. RIGIDAE—cont.</b>									
<b>10. azurea</b> Bres.	3-6 cm. mixed blue, lilac and grey, sl. greasy then scurfy with white flocci or granules; peels easily; margin rounded	crowded, chalk white, forked near stem	3-5 × 1-2 cm. white, rugulose, soft	white, soft	mild; no sm.	A 8-10 × 7-8 P8	abundant, SV: not usually blue, none in cap		conifers; uncommon
<b>11. amaena</b> Quel.	4-8 cm. lemon or flushed violet or all colours of rainbow, viscid or dry, velvety-pulverulent, hard, not peeling; margin smooth, when old sulcate	crowded, whitish to cream, edge sometimes purplish, floccose	3-5 × 1-2 cm. white, lemon or violet, often the conic; hard, pruinose	white or rusty towards base	mild; sm. peculiar when old	B-C 7-9 × 7-8 P2	sparse, SV: not blue		mixed woods
<b>III. RESILIENTES</b>									
<b>12. cyanoxantha</b> (Schaeff.) Fr.	5-15 cm. mixed lilac, purplish or dark green, seldom one colour only; greasy, shining, radially veined, $\frac{1}{2}$ peeling; margin thin, smooth, when old striate	subcrowded, white, rather narrow, adnexed, softly elastic with oily feel when stroked	5-10 × 1-3 cm. white, sometimes flushed purple, almost equal	white	mild; inodorous	A 8-9 × 6-7 P10	sparse, SV: half blue, none in cap	Fe: none or very slowly olive	leafy woods; common
<b>13. heterophylla</b> Fr.	5-8 cm. green to brown with no red or purple tints, smooth, $\frac{1}{2}$ peeling; margin thin, striate only when old	crowded, narrow, white, edge sometimes with rusty spots, subelastic when stroked; sub-decurrent	3-6 × 2-3 cm. white, rusty base; equal or pointed	white or rusty at base	mild; inodorous	A 6-7 × 5-6 or pyriform about 10 × 6 P10	sparse, SV: part blue, none in cap	Fe: flesh pink	leafy woods; common
<b>var. virginea</b> Cke. & Mass.	Same as above but pure white	"	"	"	"	"	"	"	uncommon
<b>14. vesca</b> Fr.	6-10 cm. often umbilicate, flesh-pink or dingy buff (livid brown), sl. viscid, smooth, $\frac{1}{2}$ peeling, cuticle often short of margin showing white flesh; faintly striate	crowded, narrow, white, resilient, sometimes beaded with drops staining edge rusty brown; subdecurrent	2-5 × 1-2 cm. white, turns rusty or honey colour, typically pointed, sometimes equal	white, turns rusty or honey colour	mild and nutty, inodorous	A 6-8 × 5-6 P10	sparse, SV: part blue, none in cap	Fe: salmon	leafy woods, esp. oak; common
<b>15. farinipes</b> Romell	3-5 cm. flat or depressed, light straw or ivory yellow with rusty brown spots; hardly peeling, margin striate then sulcate; elastic	crowded or subdistant, almost white then pallid, thin, narrow, often weeping, adnate or subdecurrent, elastic	2-4 × 1-2 cm. white or rusty patches, equal or pointed, elastic	white	peppery, inodorous	A 7-8 × 6-7 P10	abundant, SV: blue		leafy woods; fairly common
<b>IV. FOETENTES</b>									
<b>16. foetens</b> Fr.	8-15 cm. usually large, dingy brownish ochre or honey colour, glutinous at first then glabrous with fine radial veins. Margin thin, pectinate tubercular	subcrowded, whitish, oft. with brown spots, narrow, often weeping	5-9 × 1-3 cm. white or pale buff, rind hard, soon soft inside	white or dirty brown	bitter and peppery, strong oily smell	B-C 8-10 × 8-9 P5-6	abundant, SV: blue, none in cap	Fe: flesh pink	mixed woods; common
<b>17. laura-cerasi</b> Melzer	Very like above, but smaller and margin less grossly sulcate; differs chiefly in the remarkable spore	"	"	"	strong smell of bitter almonds	B-C 10-14 P1	"	"	beech woods
<b>18. pectinata</b> (Bull.) Fr.	2-7 cm. pale tan or toast brown, sometimes with rusty spots; viscid, peels to disc; closely pectinate and tubercular at thin margin	crowded, pallid, adnexed, narrow or broad, shape variable	2-5 × 1-2 cm. white or rusty, stained, smooth or rugulose, rather soft	white	mild; sm. rather oily	D 8-9 × 5-6 P2	SV: blue, none in cap		under oaks; fairly common

SPECIES	CAP	GILLS	STEM
<b>IV. FOETENTES—cont.</b>			
19. <i>sororia</i> Fr.	3-9 cm. dirty greyish-umber darker in centre, almost sepia, margin thin, closely tuberculate-pectinate, often wavy	crowded, pallid, arcuate or linear, narrow, sub-decurrent	2-6 × 1½-2 cm. white, soft, fragile
20. <i>consobrina</i> Fr.	like <i>R. sororia</i> but with a smooth non-sulcate margin; not a well-defined species		
<b>V. OCHRACEAE</b>			
21. <i>fellea</i> Fr.	4-8 cm. straw to honey colour, viscid, naked, smooth, edge only peeling; margin smooth	colour of cap, rounded in front, adnexed	3-8 × 1-2 cm. concolorous, visible in shape, solid, firm
22. <i>ochroleuca</i> Fr.	6-12 cm. ochraceous or bright yellow sometimes with slight olive tint, viscid, polished; margin smooth	crowded, white or creamy, broad in front, adnexed	4-8 × 1½-2 cm. white, rarely green, equal, fragile
23. <i>solaris</i> Ferd. & Winge	2-6 cm. egg yellow or paler, margin smooth, when old striate; very fragile	subdistant, white then straw, adnate	2-5 × ½-1½ cm. white, rarely with lemon spots, thinner above
24. <i>smaragdina</i> Quel.	2-3 cm. pale lemon-yellow, matt, margin smooth	subcrowded, white, ventricose	3 cm. × 5 mm. white, solid, equal
<b>VI. ACRAE</b>			
<b>(a) Leucosporae</b>			
25. <i>emetica</i> (Schaeff.) Fr.	4-10 cm. scarlet without tints of purple or violet; moist and shining; peels completely; margin smooth when young	crowded or subdistant, white, adnexed	white, rugulose, solid
var. <i>fageticola</i> Melzer	"	white with very faint glaucous glint	"
var. <i>pineticola</i> Melzer	"	white with faint but distinct yellow tint	"
26. <i>fragilis</i> Fr.	2-5 cm. crimson or purplish-red, centre often darker, margin smooth or striate	crowded or subdistant, white, edge oft. fibrillate	3-6 × ¼-1½ white or cream, fragile, spongy
var. <i>nivea</i> (Pers.) Cke.	differs in white colour of cap		
27. <i>fallax</i> (Schaeff.) Cke.	differs from <i>fragilis</i> in the olive tint in centre	crowded or subdistant, white	3-6 × ¼-1½ white or cream, fragile, spongy

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
white, spongy	acidic and rancid, sm. rancid	C 7-8 × 5-5½ P2	sparse, SV : blue, none in cap		under oaks; com- mon  uncommon
whitish at first, then concolorous	peppery; smell of pelargonium	B—C 8-9 × 6½-7 P7	SV : blue	Fe : cream	beech woods; common
white	mild or acid; sm. pleasant	B—C 9-10 × 7-8 P5	SV : blue, none in cap	Fe : whitish pink	mixed; common
white	acid; sm. faint	C—D 8-9 × 6½-7 P5	SV : blue, also in cap	Fe : pink	beech woods, un- common
white	mild or faintly acid	A 6½-7½ × 6½-7 P7	SV : blue, also in cap		oak woods; rare
white	peppery, sm. pleasant	A 9-10 × 8-9 P7	SV : blue, also in cap	Fe : flesh pink	oak, birch, etc.; fairly common
"	"	A 7½ × 6½ or (&) 10 × 8 P7	"	"	common in beech woods
"	"	A 8-9 × 7-8 P7—P3	"	"	common in pine woods
white	peppery, sm. pleasant	A—B 8-9 × 7-8 P7	SV : blue, also in cap	Fe : flesh pink	mixed woods ; common
white	peppery, sm. pleasant	A—B 8-9 × 7-8 P7	SV : blue, also in cap	Fe : flesh pink	mixed woods ; common

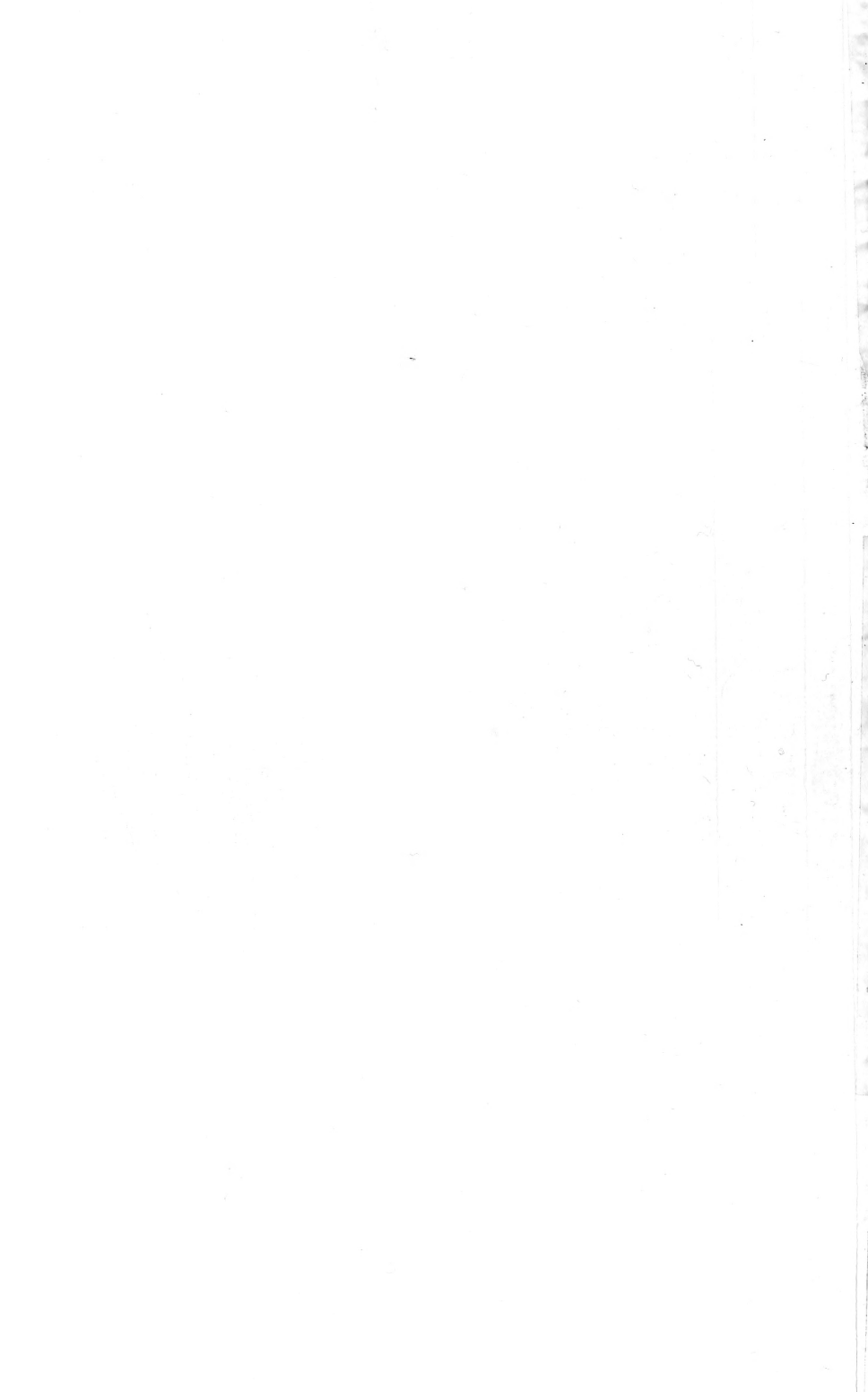




SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>IV. FOETENTES—cont.</b>									
19. <i>sororia</i> Fr.	3-9 cm. dirty greyish-umber darker in centre, almost sepia, margin thin, closely tuberculate-pectinate, often wavy	crowded, pallid, arcuate or linear, narrow, sub-decurrent	2-6 × 1½-2 cm. white, soft, fragile	white, spongy	acid and rancid, sm. rancid	C 7-8 × 5-5½ P2	sparse, SV: blue, none in cap		under oaks; common
20. <i>consobrina</i> Fr.	like <i>R. sororia</i> but with a smooth non-sulcate margin; not a well-defined species								uncommon
<b>V. OCHRACEAE</b>									
21. <i>fellea</i> Fr.	4-8 cm. straw to honey colour, viscid, naked, smooth, edge only peeling; margin smooth	colour of cap, rounded in front, adnexed	3-8 × 1-2 cm. concolorous, variable in shape, solid, firm	whitish at first, then concolorous	peppery; smell of pelargonium	B—C 8-9 × 6½-7 P7	SV: blue	Fe: cream	beech woods; common
22. <i>ochroleuca</i> Fr.	6-12 cm. ochraceous or bright yellow sometimes with slight olive tint, viscid, polished; margin smooth	crowded, white or creamy, broad in front, adnexed	4-8 × 1½-2 cm. white turns grey, equal, fragile	white	mild or acid; sm. pleasant	B—C 9-10 × 7-8 P5	SV: blue, none in cap	Fe: whitish pink	mixed; common
23. <i>solaris</i> Ferd. & Winge	2-6 cm. egg yellow or paler, margin smooth, when old striate; very fragile	subdistant, white then straw, adnate	2-5 × ½-1½ cm. white, rarely with lemon spots, thinner above	white	acid; sm. faint	C—D 8-9 × 6½-7 P5	SV: blue, also in cap	Fe: pink	beech woods, uncommon
24. <i>smaragdina</i> Quel.	2-3 cm. pale lemon-yellow, matt, margin smooth	subcrowded, white, ventricose	3 cm. × 5 mm. white, solid, equal	white	mild or faintly acid	A 6½-7½ × 6½-7 P7	SV: blue, also in cap		oak woods; rare
<b>VI. ACRAE</b>									
<b>(a) Leucosporae</b>									
25. <i>emetica</i> (Schaeff.) Fr.	4-10 cm. scarlet without tints of purple or violet; moist and shining; peels completely; margin smooth when young	crowded or subdistant, white, adnexed	white, rugulose, soft	white	peppery, sm. pleasant	A 9-10 × 8-9 P7	SV: blue, also in cap	Fe: flesh pink	oak, birch, etc.; fairly common
var. <i>faeticola</i> Melzer	"	white with very faint glaucous glint	"	"	"	A 7½ × 6½ or (8) 10 × 8 P7	"	"	common in beech woods
var. <i>pineticola</i> Melzer	"	white with faint but distinct yellow tint	"	"	"	A 8-9 × 7-8 P7—P3	"	"	common in pine woods
26. <i>fragilis</i> Fr.	2-5 cm. crimson or purplish-red, centre often darker, margin smooth or striate	crowded or subdistant, white, edge oft. fibrillate	3-6 × ½-1½ white or creamy, fragile, spongy	white	peppery, sm. pleasant	A—B 8-9 × 7-8 P7	SV: blue, also in cap	Fe: flesh pink	mixed woods; common
var. <i>nivea</i> (Pers.) Cke.	differs in white colour of cap								
27. <i>fallax</i> (Schaeff.) Cke.	differs from <i>fragilis</i> in the olive tint in centre	crowded or subdistant, white	3-6 × ½-1½ white or creamy, fragile, spongy	white	peppery, sm. pleasant	A—B 8-9 × 7-8 P7	SV: blue, also in cap	Fe: flesh pink	mixed woods; common

SPECIES	CAP	GILLS	STEM
<b>VI. ACRAE—cont.</b>			
<b>28. luteo-tacta</b> Rea	4-7 cm. scarlet or with whitish patches or spotted yellow; viscid not peeling; matt when dry; margin thin, smooth	subdistant or crowded, white, tardily chrome-yellow in patches, weeps in wet weather, adnexed or subdecurrent	4.5×1-1½ cm. white or part pale or spotted yellow
(b) <b>Pallidisporae</b>			
<b>29. violacea</b> Quel.	3-6 cm. pale violaceous-purple with lilac patches and whitish margin, viscid, polished, striate	crowded, ivory white, adnexed	3-4×½-1 cm. white, fragil, striate
<b>30. sanguinea</b> (Bull.) Fr.	4-10 cm. blood red turning paler or yellowish in patches or round margin; viscid, matt when dry; not peeling; margin thin, smooth	crowded, ivory white, later with yellow spots, narrow, decurrent	4-10×1-2 cm. white or flushed pink, later spotted yellow; firm
<b>31. Queletii</b> Fr.	5-10 cm. wine red to violaceous purple, rather viscid then pruinose, margin slightly striate when old	subcrowded, ivory white then cream or a bluish-grey, subdecurrent	3-6×1-1½ cm. carmine to wine red, equal or clavate
<b>32. drimeia</b> Cke.	5-10 cm. dark violaceous-purple, paler with age; sl. viscid, smooth and rather polished; margin thin sl. striate when old	subcrowded, pale sulphur or primrose then saffron yellow, narrow, linear, oft. weeping, adnexed	3-7×1½-2½ cm. violet-purple pale background pruinose equal clavate
var. <i>viridis</i> Singer	differs from type in green colour of cap		
(c) <b>Xanthosporae</b>			
<b>33. rubra</b> (Krombh.) Bres.	4-11 cm. scarlet or with whitish margin, rarely all white flushed pink; matt, velvety-felty, hardly peeling; margin smooth	crowded, white then yellow, adnexed	white, rugulose
<b>34. maculata</b> Quel.	5-9 cm. pale reddish or flesh pink then yellow or ivory white with rusty spots; viscid at first then matt; margin thin, smooth	crowded or distant, pale apricot, broad, adnexed or subdecurrent	2.5×1½-3 cm. white with rusty spots, firm, so
<b>35. veternosa</b> Fr.	3-8 cm. pink or flesh pink mostly with a creamy or yellowish centre, viscid then matt, ½ peeling, soft, rather fragile	crowded, ochraceous, thin and brittle, veined	2-4×1-2 cm. rather slender, white soft
<b>36. luteo-viridans</b> Martin	3-10 cm. pale greenish-buff, margin tinged red; greasy, shining; peels half way	crowded, orange-buff	3-5×3 cm. white, rugulose, firm then spongy
<b>VII. SUB-ACRAE</b>			
(a) <b>Leucosporae</b>			
<b>37. atro-purpurea</b> Krombh.	5-10 cm. dark purplish-red, blackish at disc, greasy, smooth or wrinkled; peeling only at margin, hardly striate when old	white or stained brown, narrow or broad; adnexed or subdecurrent	white, rusty at base often grey when old
var. <i>depallens</i> (Cke.) Maire	differs in colours being a dull purple and black, mottled with ivory yellow		

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
te, tinged yellow when it	very acrid; sm. faint	A $7\frac{1}{2}-8 \times 6-6\frac{1}{2}$ P5	SV: blue, also in cap	Fe: reddish	leafy woods; common
te	tardily acrid; sm. peculiar ? cloves	B $8-10 \times 7-8\frac{1}{2}$ P5	SV: blue, also in cap	Fe: pale orange-pink	damp woods; rare
ite with laucous tint	acid and bitter; sm. faint	C $7-9 \times 7-8$ P6	SV: blue, also in cap	Fe: flesh pink	pine woods, uncommon
te or with reenish tint	very acrid; sm. pleasant	C—D $8-10 \times 7-9$ P5	SV: blue, also in cap	Fe: flesh pink; Ammonia: nil	under conifers; common
ite or lemon tinted	v. acrid; inodorous or pleasant	C—E $7-9 \times 6\frac{1}{2}-8$ P4	SV: blue, also in cap	Fe: deep flesh pink; Ammonia: red	pine woods; common  uncommon
ite	very acrid; inodorous	bright ochre $8-9 \times 7-7\frac{1}{2}$ P4	SV: blue, also in cap		mixed woods; rare
ite	mild, then rather acrid; sm. fragrant	G—H $9-10 \times 8-9$ P3—P6	SV: blue, also in cap	Fe: grey. SV: dark purple	beech woods; fairly common
ite	mild, acrid after mastication; sm. honey	G—H $7-10 \times 6-9$ P6	SV: blue, also in cap		leafy woods; uncommon
ite	rather acrid; inodorous	G $9\frac{1}{2} \times 7$ P6	SV: blue, also in cap	Fe: none at first then greyish	mixed woods; rare
ite then greyish	mild or sl. acrid; inodorous	A—B $8-9 \times 7-7\frac{1}{2}$ P4	SV: blue, also in cap	Fe: pale pink	mixed woods; common  common





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>VI. ACRAE—cont.</b>									
<b>28. lutea-tacta</b> Rea	4-7 cm. scarlet or with whitish patches or spotted yellow; viscid not peeling; matt when dry; margin thin, smooth	substant or crowded, white, tardily chrome-yellow in patches, weeps in wet weather, adnexed or subdecurrent	4-5 × 1-1½ cm. white or part pink or spotted yellow	white, tinged yellow when cut	very acid; sm. faint	A 7½-8 × 6-6½ P5	SV: blue, also in cap	Fe: reddish	leafy woods; common
(b) <b>Pallidisporae</b>									
<b>29. violacea</b> Quel.	3-6 cm. pale violaceous-purple with lilac patches and whitish margin, viscid, polished, striate	crowded, ivory white, adnexed	3-4 × ½-1 cm. white, fragile, striate	white	tardily acid; sm. peculiar ? cloves	B 8-10 × 7-8½ P5	SV: blue, also in cap	Fe: pale orange-pink	damp woods; rare
<b>30. sanguinea</b> (Bull.) Fr.	4-10 cm. blood red turning paler or yellowish in patches or round margin; viscid, matt when dry; not peeling; margin thin, smooth	crowded, ivory white, later with yellow spots, narrow, decurrent	4-10 × 1-2 cm. white or flushed pink, later spotted yellow; firm	white with glaucous tint	acid and bitter; sm. faint	C 7-9 × 7-8 P6	SV: blue, also in cap	Fe: flesh pink	pine woods, uncommon
<b>31. Queletii</b> Fr.	5-10 cm. wine red to violaceous purple, rather viscid then pruinose, margin slightly striate when old	subcrowded, ivory white then cream or a bluish-grey, subdecurrent	3-6 × 1-1½ cm. carmine to wine red, equal or clavate	white or with greenish tint	very acid; sm. pleasant	C-D 8-10 × 7-9 P5	SV: blue, also in cap	Fe: flesh pink; Ammonia: nil	under conifers; common
<b>32. drimeia</b> Cke.	5-10 cm. dark violaceous-purple, paler with age; sl. viscid, smooth and rather polished; margin thin sl. striate when old	subcrowded, pale sulphur or primrose then saffron yellow, narrow, linear, oft. weeping, adnexed	3-7 × 1½-2½ cm. violet-purple on pale background, pruinose equal or clavate	white or lemon tinted	v. acid; inodorous or pleasant	C-E 7-9 × 6½-8 P4	SV: blue, also in cap	Fe: deep flesh pink; Ammonia: red	pine woods; common
<b>var. viridis</b> Singer	differs from type in green colour of cap								uncommon
(c) <b>Xanthosporae</b>									
<b>33. rubra</b> (Krombh.) Bres.	4-11 cm. scarlet or with whitish margin, rarely all white flushed pink; matt, velvety-felt, hardly peeling; margin smooth	crowded, white then yellow, adnexed	white, rugulose	white	very acid; inodorous	bright ochre 8-9 × 7-7½ P4	SV: blue, also in cap		mixed woods; rare
<b>34. maculata</b> Quel.	5-9 cm. pale reddish or flesh pink then yellow or ivory white with rusty spots; viscid at first then matt; margin thin, smooth	crowded or distant, pale apricot, broad, adnexed or subdecurrent	2-5 × 1½-3 cm. white with rusty spots, firm, solid	white	mild, then rather acid; sm. fragrant	G-H 9-10 × 8-9 P3-P6	SV: blue, also in cap	Fe: grey. SV: dark purple	beech woods; fairly common
<b>35. veterana</b> Fr.	3-8 cm. pink or flesh pink mostly with a creamy or yellowish centre, viscid then matt, ½ peeling, soft, rather fragile	crowded, ochraceous, thin and brittle, veined	2-4 × 1-2 cm. rather slender, white soft	white	mild, acid after mastication; sm. honey	G-H 7-10 × 6-9 P6	SV: blue, also in cap		leafy woods; uncommon
<b>36. lutea-viridans</b> Martin	3-10 cm. pale greenish-buff, margin tinged red; greasy, shining; peels half way	crowded, orange-buff	3-5 × 3 cm. white, rugulose, firm then spongy	white	rather acid; inodorous	G 9½ × 7 P6	SV: blue, also in cap	Fe: none at first then greyish	mixed woods; rare
<b>VII. SUB-ACRAE</b>									
(a) <b>Leucosporae</b>									
<b>37. atra-purpurea</b> Krombh.	5-10 cm. dark purplish-red, blackish at disc, greasy, smooth or wrinkled; peeling only at margin, hardly striate when old	white or stained brown, narrow or broad; adnexed or subdecurrent	white, rusty at base, often grey when old	white then greyish	mild or sl. acid; inodorous	A-B 8-9 × 7-7½ P4	SV: blue, also in cap	Fe: pale pink	mixed woods; common
<b>var. depallens</b> (Cke.) Maire	differs in colours being a dull purple and black, mottled with ivory yellow								common

SPECIES	CAP	GILLS	STEM
<b>VII SUB-ACRAE—cont.</b>			
<b>(b) Pallidisporae</b>			
<b>38. <i>gracillima</i></b> J. Schaeffer	1½-6 cm. with shallow umbo, olive green centre blending into greyish green and rosy pink round margin which is thin, smooth at first then striate-tuberculate	white to pale cream thin, fragile; adnexed, subdecurrent or free	4-5×½-1 cm. white flushed pink base stains brown clavate, spiny brittle
<b>(c) Xanthosporae</b>			
<b>39. <i>pseudo-integra</i></b> Arn. & Goris	7-10 cm. scarlet, turning paler, viscid soon dry, matt, ½ peeling, margin thick, striate when old	subcrowded, white then cream to ochraceous, edge oft. fimbriate	white, rugose spongy
<b>40. <i>exalbicans</i></b> Secr.	5-7 cm. pink with pale patches or completely dingy white but usually with a trace of pink, ½ peeling, viscid at first, satiny, margin thin, smooth then striate	white then cream, narrow, linear, thin, brittle	3-4×1-1½ cm. white soon grey in wet weather rugulose
<b>41. <i>nitida</i></b> (Pers.) Fr.	3-6 cm. bluish-violet to violaceous-pink, darker in centre or with copper tint, or tinge of olive; viscid then glossy or scurfy; peels easily	cream then egg yellow, edgesometimes whitish or with glaucous tint	white, hard spongy, smooth
<b>42. <i>versicolor</i></b> J. Schaeffer	1½-6 cm. suffused colours: brown, red, purple, violet, yellow, usually with trace of green in centre; moist or greasy, margin thin, smooth, striate when old	cream, fairly broad, adnexed or free	2-5×1-1½ cm. equal or enlarged above, whitish turns yellowish
<b>VIII. GRATAE</b>			
<b>(a) Pallidisporae</b>			
<b>43. <i>lilacea</i></b> Quel.	3-7 cm. lilac or flesh pink, viscid, then matt or with scurfy surface, easily peeling, margin smooth then striate	subdistant, white then very pale cream, free	3-5×1-2 cm. white or flushed pink, soft, fragile
<b>44. <i>grisea</i></b> (Secr.) Gill.	6-9 cm. greyish-lilac mixed with pink, yellow or olive; polished, smooth, ½ peeling, margin smooth, striate when old	white then cream, adnexed	3-6×1-2½ cm. white or flushed purple, even clavate
<b>45. <i>aeruginea</i></b> Lindbl.	5-9 cm. grass green to olive, stains brown to touch; moist and shining, smooth, ½ peeling; margin soon striate	white then butter yellow or with orange glint, adnexed	4-7×1-2 cm. white, base orange rusty, firm to spongy
<b>46. <i>melliolens</i></b> Quel.	5-8 cm. scarlet or red with ochraceous patches; smooth, moist; rarely striate	white then cream or with ochre stains, edge sometimes red near margin	4-8×1-2½ cm. white or flushed pink, stains orange
var. <i>Chrysanthiae</i> Maire	differs only in acrid taste		
<b>47. <i>puellaris</i></b> Fr.	3-5 cm. flesh or purplish-pink with flush of brown, darker in centre; moist, shining, fragile, ½ peeling, sulcate	cream turns wax-yellow	white staining yellow, rugulose fragile
var. <i>leprosa</i> Bres.	differs in having white fugacious flocci on cap		

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
te	mild or faintly acrid ; sm. faint	C—D 8-9×7-7½ P6	SV : blue, also in cap		under birch ; uncommon
te	mild then bitter (not acid) ; inodorous	F—G 8-9×7-8 P5	incrusted SV : red or sl. blue at apex, none in cap		mixed woods ; chiefly oak and birch
te or grey	mild in stem, acrid gills ; sm. faint	E—F 9-10×6-7 P4	SV : blue, none in cap	Fe : faint pink	birch ; fairly common
e white	mild stem, acrid gills, or only bitter ; sm. faint	G—H 9-12×8-10 P6	SV : blue, also in cap		mixed woods ; rare
ite, turns yellowish	mild stem, sl. acrid gills ; sm. faint	E—F 9-10×6-7 P4	SV : blue, also in cap	Fe : flesh pink	under birches ; common
ite, soft	mild ; inodorous	B 7-9×6-7 P6	sparse, SV : not blue ; none in cap	Fe : rusty red	leafy woods ; rare
ite	mild or slightly acrid when young ; in- odorous	C—D 6½-9×5½-7 P7	SV : red or blue, also in cap	Fe : flesh or rusty pink	leafy woods ; common
ite or with brown stains	mild or sl. acrid when young ; inodorous	D—E 8×6 P8	SV : blue	Fe : cream or dirty olive inside stem	birch ; common
ite, turns brown	mild ; inodorous at first, then smells of honey	D 9-10 P11	SV : blue, claw shaped hyphae in cap	Fe : rusty red	leafy woods ; not common  uncommon
ite, turns vax-yellow	mild ; sm. faint	D 7-9 P6	SV : blue, also in cap	Fe : flesh pink	conifers ; com- mon  rare





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>VII. SUB-ACRAE—cont.</b>									
<b>(b) Pallidisporae</b>									
<b>38. gracillima</b> J. Schaeffer	1½-6 cm. with shallow umbo, olive green centre blending into greyish green and rosy pink round margin which is thin, smooth at first then striate-tuberculate	white to pale cream thin, fragile; adnexed, subdecurrent or free	4.5×1-1½ cm. white flushed pink base stains brown clavate, spongy brittle	white	mild or faintly acid; sm. faint	C—D 8-9×7-7½ P6	SV: blue, also in cap		under birch; uncommon
<b>(c) Xanthosporae</b>									
<b>39. pseudo-integra</b> Arn. & Goris	7-10 cm. scarlet, turning paler, viscid soon dry, matt, ½ peeling, margin thick, striate when old	subcrowded, white then cream to ochraceous, edge oft. fimbriate	white, rugulose spongy	white	mild then bitter (not acid); inodorous	F—G 8-9×7-8 P5	incrusted. SV: red or sl. blue at apex, none in cap		mixed woods; chiefly oak and birch
<b>40. exalbicans</b> Secr.	5-7 cm. pink with pale patches or completely dingy white but usually with a trace of pink, ½ peeling, viscid at first, satiny, margin thin, smooth then striate	white then cream, narrow, linear, thin, brittle	3-4×1-1½ cm. white soon grey esp. in wet weather rugulose	white or grey	mild in stem, acid gills; sm. faint	E—F 9-10×6-7 P4	SV: blue, none in cap	Fe: faint pink	birch; fairly common
<b>41. nitida</b> (Pers.) Fr.	3-6 cm. bluish-violet to violaceous-pink, darker in centre or with copper tint, or tinge of olive; viscid then glossy or scurfy; peels easily	cream then egg yellow, edges sometimes whitish or with glaucous tint	white, hard then spongy, smooth	white	mild stem, acid gills, or only bitter; sm. faint	G—H 9-12×8-10 P6	SV: blue, also in cap		mixed woods; rare
<b>42. versicolor</b> J. Schaeffer	1½-6 cm. suffused colours: brown, red, purple, violet, yellow, usually with trace of green in centre; moist or greasy, margin thin, smooth, striate when old	cream, fairly broad, adnexed or free	2.5×1-1½ cm. equal or enlarged above, white turns yellowish	white, turns yellowish	mild stem, sl. acid gills; sm. faint	E—F 9-10×6-7 P4	SV: blue, also in cap	Fe: flesh pink	under birches; common
<b>VIII. GRATAE</b>									
<b>(a) Pallidisporae</b>									
<b>43. lilacea</b> Quel.	3-7 cm. lilac or flesh pink, viscid, then matt or with scurfy surface, easily peeling, margin smooth then striate	subdistant, white then very pale cream, free	3-5×1-2 cm. white or flushed pink, soft, fragile	white, soft	mild; inodorous	B 7-9×6-7 P6	sparse, SV: not blue; none in cap	Fe: rusty red	leafy woods; rare
<b>44. grisea</b> (Secr.) Gill.	6-9 cm. greyish-lilac mixed with pink, yellow or olive; polished, smooth, ½ peeling, margin smooth, striate when old	white then cream, adnexed	3-6×1-2½ cm. white or flushed purple, even or clavate	white	mild or slightly acid when young; inodorous	C—D 6½-9×5½-7 P7	SV: red or blue, also in cap	Fe: flesh or rusty pink	leafy woods; common
<b>45. aeruginea</b> Lindbl.	5-9 cm. grass green to olive, stains brown to touch; moist and shining, smooth, ½ peeling; margin soon striate	white then butter yellow or with orange glint, adnexed	4-7×1-2 cm. white, base often rusty, firm then spongy	white or with brown stains	mild or sl. acid when young; inodorous	D—E 8×6 P8	SV: blue	Fe: cream or dirty olive inside stem	birch; common
<b>46. mellialens</b> Quel.	5-8 cm. scarlet or red with ochraceous patches; smooth, moist; rarely striate	white then cream or with ochre stains, edge sometimes red near margin	4-8×1-2½ cm. white or flushed pink, stains ochre	white, turns brown	mild; inodorous at first, then smells of honey	D 9-10 P11	SV: blue, claw shaped hyphae in cap	Fe: rusty red	leafy woods; not common
var. <i>Chrismantiae</i> Maire	differs only in acid taste								uncommon
<b>47. puellaris</b> Fr.	3-5 cm. flesh or purplish-pink with flush of brown, darker in centre; moist, shining, fragile, ½ peeling, sulcate	cream turns wax-yellow	white staining wax-yellow, rugulose, fragile	white, turns wax-yellow	mild; sm. faint	D 7-9 P6	SV: blue, also in cap	Fe: flesh pink	conifers; common
var. <i>leprasa</i> Bres.	differs in having white fugacious flocci on cap								rare

SPECIES	CAP	GILLS	STEM
<b>VIII. GRATAE</b>			
(a) <b>Pallidisporae</b> —cont.			
48. <i>brunneo-violacea</i> Crawshawy	3-10 cm. dark violet, later violet-brown or violaceous-purple occasionally with yellow patches; viscid then matt; peels easily	white then cream	3-5 × ½-1½ cm. white stains brown to touch, then soft
(b) <b>Xanthosporae</b>			
49. <i>decolorans</i> Fr.	5-10 cm. creamy-orange to coppery-orange or brick red, discolouring and staining black or brown, smooth, peeling only at margin	subcrowded, cream to primrose or lemon tinted, turning black	6-10 × 1-2 cm. white then ash or blackish
50. <i>claroflava</i> Grove	5-10 cm. chrome or lemon-yellow, moist then matt, smooth, stains blackish	subcrowded, cream to primrose or lemon tinted, turning black	6-10 × 1-2 cm. white then ash or blackish
51. <i>obscura</i> Romell	7-8 cm. vinaceous-purple, dark in centre blending with other purplish tints	subcrowded, white then cream, edge often red near margin	6-7 × 2 cm. white turns blackish grey
52. <i>xerampelina</i> Fr.	5-12 cm. varies from all shades of wine or purplish-red to brown; viscid at first, soon dry and matt	crowded to distant, cream to ochre staining brown; edge sometimes purplish	4-6 × 1½-3 cm. white or part stains honey-colour or brown
var. <i>erythropus</i> (Pelt.) M. & Z.	large size with both cap and stem blood red	„	blood red
var. <i>fusca</i> M. & Z.	buff or brown	„	white
var. <i>olivascens</i> (Fr.) M. & Z.	olivaceous	„	white
53. <i>alutacea</i> (Pers.) Fr.	6-15 cm. all colours from violaceous-purple, brownish-red to olive green or ochre, firm, smooth, peels at margin	crowded or distant, ochre then egg yellow, sometimes red edge, thick, veined	5-8 × 1½-4 cm. white, apex red purple; hard
54. <i>olivacea</i> (Schaeff.) Fr.	8-15 cm. olive green or brown blended with dingy wine-purple, firm, matt, ½ peeling	ochre with lemon glint then almost orange-tan, edge often red near margin	3-7 × 2-3 cm. pink, hard
55. <i>Romellii</i> Maire	8-15 cm. purplish-red to olive discolouring to yellow, fragile, peeling to centre	subdistant, white then cream, powdered with ochraceous spores	6-9 × 1½-2 cm. white
56. <i>curtipes</i> Möll. & Sch.	5-12 cm. creamy-buff, brownish or purplish-red towards margin, centre white flocculose at first, peels at margin	subdistant or crowded, white then cream, finally ochre, sl. emarginate	3-7 × 2-4 cm. white turns brown to solid, hard

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
white	mild, inodorous	B—D 8½-9 × 6½-7 P5	SV : blue, also in cap	Fe : flesh to rusty pink	leafy woods, mostly oak ; common
white, turns dingy copper- red then black	mild ; sl. bitter or acrid wh. young ; sm. faint	E 10-14 × 9-12 P5—6 long spines	SV : blue, sometimes in cap	Fe : pale pink	conifers ; un- common
white or pinkish then black	mild ; sl. bitter or acrid wh. young ; sm. faint	E—F 9 × 8 P5 or 6	SV : blue, not in cap	Fe : flesh pink tardily dirty olive	damp birch woods ; com- mon
white slowly red to blackish	mild ; inodorous	F 10-10½ × 8½-9 P5 or 6	SV : blue, not in cap	Fe : flesh pink tardily dirty olive	damp coniferous woods ; rare
white, stains brownish-yel- low	mild ; smells fishy, or of crab	E—F 8-11 × 6½-8 P6	SV : blue	Fe : quickly olive green	all woods ; common
"	"	"	"	"	uncommon
"	"	"	"	"	common
"	"	"	"	"	rare
white	mild ; inodorous	G—H 8-11 × 7-8 P6 long spines	SV : blue, none in cap	Fe : deep flesh pink	beech woods ; common
white, turns lemon or tan or dingy olive	mild ; inodorous	G—H 8-13 × 8-12 P6	SV : not blue, none in cap	Fe : deep flesh pink	mixed woods ; uncommon
white	mild ; inodorous	G—H 7-9 × 6-7 P3	SV : blue, also in cap	Fe : orange pink	leafy woods ; uncommon
white	mild ; sm. pleasant	F 7½-10 × 6½-8 P3	SV : blue, none in cap	Fe : flesh pink	beech woods ; uncommon





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>VIII. GRATAE</b>									
(a) <i>Paludisporae</i> —cont.									
<b>48. brunneo-violaceo</b> Crawshaw	3-10 cm. dark violet, later violet-brown or violaceous-purple occasionally with yellow patches; viscid then matt; peels easily	white then cream	3.5 × 1.1 cm. white stains brown to touch, firm then soft	white	mild, inodorous	B—D 8.9 × 6.7 P5	SV: blue, also in cap	Fe: flesh to rusty pink	leafy woods, mostly oak; common
(b) <i>Xanthosporae</i>									
<b>49. decolorans</b> Fr.	5-10 cm. creamy-orange to coppery-orange or brick red, discolouring and staining black or brown, smooth, peeling only at margin	subcrowded, cream to primrose or lemon tinted, turning black	6-10 × 1.2 cm. white then ash grey or blackish	white, turns dingy copper-red then black	mild; sl. bitter or acid wh. young; sm. faint	E 10-14 × 9-12 P5—6 long spines	SV: blue, sometimes in cap	Fe: pale pink	conifers; uncommon
<b>50. claroflavo</b> Grove	5-10 cm. chrome or lemon-yellow, moist then matt, smooth, stains blackish	subcrowded, cream to primrose or lemon tinted, turning black	6-10 × 1.2 cm. white then ash grey or blackish	white or pinkish then black	mild; sl. bitter or acid wh. young; sm. faint	E—F 9 × 8 P5 or 6	SV: blue, not in cap	Fe: flesh pink tardily dirty olive	damp birch woods; common
<b>51. obscuro</b> Romell	7-8 cm. vinaceous-purple, dark in centre blending with other purplish tints	subcrowded, white then cream, edge often red near margin	6-7 × 2 cm. white turns blackish grey	whiteslowly red to blackish	mild; inodorous	F 10-10.4 × 8.9 P5 or 6	SV: blue, not in cap	Fe: flesh pink tardily dirty olive	damp coniferous woods; rare
<b>52. xerampelino</b> Fr.	5-12 cm. varies from all shades of wine or purplish-red to brown; viscid at first, soon dry and matt	crowded to distant, cream to ochre staining brown; edge sometimes purplish	4-6 × 1.3 cm. white or part red stains honey-yellow or rusty brown	white, stains brownish-yellow	mild; smells fishy, or of crab	E—F 8-11 × 6.8 P6	SV: blue	Fe: quickly olive green	all woods; common
var. <i>erythropus</i> (Pelt.) M. & Z.	large size with both cap and stem blood red	"	blood red	"	"	"	"	"	uncommon
var. <i>fusco</i> M. & Z.	buff or brown	"	white	"	"	"	"	"	common
var. <i>olivoscens</i> (Fr.) M. & Z.	olivaceous	"	white	"	"	"	"	"	rare
<b>53. olutacea</b> (Pers.) Fr.	6-15 cm. all colours from violaceous-purple, brownish-red to olive green or ochre, firm, smooth, peels at margin	crowded or distant, ochre then egg yellow, sometimes red edge, thick, veined	5-8 × 1.4 cm. white, apex red or purple; hard	white	mild; inodorous	G—H 8-11 × 7-8 P0 long spines	SV: blue, none in cap	Fe: deep flesh pink	beech woods; common
<b>54. olivacea</b> (Schaeff.) Fr.	8-15 cm. olive green or brown blended with dingy wine-purple, firm, matt, ½ peeling	ochre with lemon glint then almost orange-tan, edge often red near margin	3-7 × 2.3 cm. pink, hard	white, turns lemon or tan or dingy olive	mild; inodorous	G—H 8-13 × 8-12 P6	SV: not blue, none in cap	Fe: deep flesh pink	mixed woods; uncommon
<b>55. Romellii</b> Maire	8-15 cm. purplish-red to olive discolouring to yellow, fragile, peeling to centre	subdistant, white then cream, powdered with ochraceous spores	6-9 × 1.2 cm. white	white	mild; inodorous	G—H 7-9 × 6-7 P3	SV: blue, also in cap	Fe: orange pink	leafy woods; uncommon
<b>56. curtipes</b> Möhl. & Sch.	5-12 cm. creamy-buff, brownish or purplish-red towards margin, centre white flocculose at first, peels at margin	subdistant or crowded, white then cream, finally ochre, sl. emarginate	3-7 × 2.4 cm. white turns foveate brown to touch, solid, hard	white	mild; sm. pleasant	F 7.2-10 × 6.8 P3	SV: blue, none in cap	Fe: flesh pink	beech woods; uncommon

SPECIES	CAP	GILLS	STEM
<b>VIII. GRATAE</b>			
(b) <i>Xanthosporae</i> —cont.			
57. <i>integra</i> (Linn.) Fr.	6-12 cm. dull red, brownish-red to chocolate, $\frac{1}{2}$ peeling, viscid then satiny	subcrowded, cream then ochre, powdery, adnexed or free	3-9 × 1 $\frac{1}{4}$ -3 cm. white
58. <i>caerulea</i> Cke.	5-8 cm. with small umbo rarely absent, dark violet-purple, centre blackish, polished, $\frac{1}{2}$ peeling	subcrowded, cream then ochre, broad, ventricose, adnexed	4-9 × 1-2 cm. usually long, fragile
59. <i>Turci</i> Bres.	3-7 cm. violaceous-purple, amethyst or brown tinted, centre dark, turning golden-yellow with age, granular matt as if lightly powdered	cream then ochre or egg yellow, veined, free	5-7 × 1-2 $\frac{1}{2}$ cm. white or red tinted, fragile
60. <i>Velenovskyi</i> M. & Z.	3-8 cm. light brick red, matt granular surface, $\frac{1}{2}$ peels, margin often cracks	cream then pale ochre, edge often red near margin	3-6 × 1-1 $\frac{1}{2}$ cm. white or flushed pink, equal, firm
61. <i>paludosa</i> Britz	4-12 cm. very variable from umber brown, olive-brown or brick red blended with other colours, $\frac{1}{2}$ or $\frac{3}{4}$ peeling, viscid, smooth	subdistant, white or cream then ochre, veined, brittle, broad	5-15 × 1 $\frac{1}{2}$ -3 cm. usually long white with red tinged clavate or ventricose
62. <i>aurata</i> (With.) Fr.	4-9 cm. blood to orange-red with patches of golden yellow, viscid polished then matt, peels at margin only	subcrowded, white then cream with lemon or chrome yellow edge	3-8 × 1 $\frac{1}{2}$ -2 $\frac{1}{2}$ cm. white, firm then soft
63. <i>lutea</i> (Huds.) Fr.	2-6 cm. thin, egg yellow or blended with brick and pinkish tints like an apricot, viscid then matt; peels completely	egg yellow almost orange, edge pale, adnexed or free	2-6 × $\frac{1}{2}$ -1 $\frac{1}{2}$ cm. white, hollow, soft
forma <i>luteorosella</i> Britz.	apricot or flame coloured	egg yellow almost orange, edge pale, adnexed or free	2-6 × $\frac{1}{2}$ -1 $\frac{1}{2}$ cm. white, hollow, soft
64. <i>venosa</i> Vel.	3-6 cm. usually wine red or pink, paler with age, but occurs in wide colour range; shining, margin strikingly striate-sulcate	subdistant, cream, veined, rather broad	3-9 × 1-2 cm. white, usually flushed pink, clavate, hollow
65. <i>scotica</i> Pearson	4-6 cm. light to dark buff, viscid at first, smooth, polished, margin striate-sulcate	crowded, light cream, linear, adnexed or free	5-6 × 1 $\frac{1}{2}$ cm. white, soft, subviscid, rugulose
66. <i>nauseosa</i> (Pers.) Fr.	2-7 cm. thin, livid purplish-pink or salmon or olive tinted, turning yellowish with brown centre; polished, peels easily	crowded or distant, cream then ochre or egg yellow with orange tinge	2-6 × $\frac{1}{2}$ -2 cm. white, often stained ochre or grey, fragile

FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
white, firm then spongy	mild; sm. faint, or none	G—H 9-11 × 8-9 P6	SV: blue, also in cap	Fe: inside stem dirty olive; outside yellow-grey	conifers; uncommon
white	mild or sl. acrid; when young	G 8-10 × 8-9 P7	SV: blue, none in cap	Fe: red	pine woods; common
white	mild; inodorous or base like iodoform	G 8-9 × 7-8 P7	SV: not blue, none in cap	Fe: pale pink	pine woods; uncommon
white	mild; inodorous	E—F 8-9 × 6-7½ P6	SV: blue	Fe: pink	leafy woods; common
white	mild; sm. strong, pleasant	D—E 9-10 × 7-8 P3	SV: blue, also in cap	Fe: smoky brown on flesh, on stem flesh pink	damp conifer woods or peat bogs; uncommon
white or with lemon tint	mild; inodorous	H 8-10 × 7-8 P3	SV: blue, none in cap		mixed woods; common
white	mild; sm. faint, of apricot	H 7½-9 × 7-8 P6	SV: blue, none in cap		leafy woods; common
white	mild; sm. faint, of apricot	H 7½-9 × 7-8 P6	SV: blue, none in cap		common
white	mild; sm. faint	E—G 9-11 × 8-9 P6	SV: blue, also in cap	Fe: flesh pink	damp birch woods, often in <i>Sphagnum</i> ; common
white	mild; inodorous	F 8-9 × 7-7½ P4	SV: blue, also in cap	Fe: pink	birch; rare
white or greyish	mild or sl. acrid in gills; sm. faint or strong	G—H 8-11 × 7-9 P4 or 5	SV: blue, also in cap		conifers; common





SPECIES	CAP	GILLS	STEM	FLESH	TASTE AND SMELL	SPORES	CYSTIDIA	CHEMICAL REACTIONS	HABITAT
<b>VIII. GRATAE</b>									
<b>(b) Xanthosporae—cont.</b>									
<b>57. integra</b> (Linn.) Fr.	6-12 cm. dull red, brownish-red to chocolate, $\frac{1}{2}$ peeling, viscid then satiny	subcrowded, cream then ochre, powdery, adnexed or free	3-9 $\times$ 1-3 cm. white	white, firm then spongy	mild; sm. faint, or none	G—H 9-11 $\times$ 8-9 P6	SV: blue, also in cap	Fe: inside stem dirty olive; outside yellow-grey	conifers; uncommon
<b>58. caeruleo</b> Cke.	5-8 cm. with small umbo rarely absent, dark violet-purple, centre blackish, polished, $\frac{1}{2}$ peeling	subcrowded, cream then ochre, broad, ventricose, adnexed	4-9 $\times$ 1-2 cm. usually long, firm	white	mild or sl. acrid; when young	G 8-10 $\times$ 8-9 P7	SV: blue, none in cap	Fe: red	pine woods; common
<b>59. Turci</b> Bres.	3-7 cm. violaceous-purple, amethyst or brown tinted, centre dark, turning golden-yellow with age, granular matt as if lightly powdered	cream then ochre or egg yellow, veined, free	5-7 $\times$ 1-2 $\frac{1}{2}$ cm. white or red tinted, fragile	white	mild; inodorous or base like iodoform	8-9 $\times$ 7-8 P7	SV: not blue, none in cap	Fe: pale pink	pine woods; uncommon
<b>60. Yelenovskyi</b> M. & Z.	3-8 cm. light brick red, matt granular surface, $\frac{1}{2}$ peels, margin often cracks	cream then pale ochre, edge often red near margin	3-6 $\times$ 1-1 $\frac{1}{2}$ cm. white or flushed pink, equal, firm	white	mild; inodorous	E—F 8-9 $\times$ 6-7 $\frac{1}{2}$ P6	SV: blue	Fe: pink	leafy woods; common
<b>61. poludosa</b> Britz.	4-12 cm. very variable from amber brown, olive-brown or brick red, blended with other colours, $\frac{1}{2}$ or $\frac{1}{4}$ peeling, viscid, smooth	substant, white or cream then ochre, veined, brittle, broad	5-15 $\times$ 1-3 cm. usually long white, with red tinge, clavate or ventr.	white	mild; sm. strong, pleasant	D—E 9-10 $\times$ 7-8 P3	SV: blue, also in cap	Fe: smoky brown on flesh, on stem flesh pink	damp conifer woods or peat bogs; uncommon
<b>62. ourato</b> (With.) Fr.	4-9 cm. blood to orange-red with patches of golden yellow, viscid polished then matt, peels at margin only	subcrowded, white then cream with lemon or chrome yellow edge	3-8 $\times$ 1-2 $\frac{1}{2}$ cm. white, firm then soft	white or with lemon tint	mild; inodorous	H 8-10 $\times$ 7-8 P3	SV: blue, none in cap		mixed woods; common
<b>63. luteo</b> (Huds.) Fr.	2-6 cm. thin, egg yellow or blended with brick and pinkish tints like an apricot, viscid then matt; peels completely	egg yellow almost orange, edge pale, adnexed or free	2-6 $\times$ $\frac{1}{2}$ -1 $\frac{1}{2}$ cm. white, hollow, soft	white	mild; sm. faint, of apricot	H 7 $\frac{1}{2}$ -9 $\times$ 7-8 P6	SV: blue, none in cap		leafy woods; common
forma <b>luteorosello</b> Britz.	apricot or flame coloured	egg yellow almost orange, edge pale, adnexed or free	2-6 $\times$ $\frac{1}{2}$ -1 $\frac{1}{2}$ cm. white, hollow, soft	white	mild; sm. faint, of apricot	H 7 $\frac{1}{2}$ -9 $\times$ 7-8 P6	SV: blue, none in cap		common
<b>64. venoso</b> Vel.	3-6 cm. usually wine red or pink, paler with age, but occurs in wide colour range; shining, margin strikingly striate-sulcate	substant, cream, veined, rather broad	3-9 $\times$ 1-2 cm. white, usually flushed pink, clavate, hollow	white	mild; sm. faint	E—G 9-11 $\times$ 8-9 P6	SV: blue, also in cap	Fe: flesh pink	damp birch woods, often in <i>Sphagnum</i> ; common
<b>65. scotico</b> Pearson	4-6 cm. light to dark buff, viscid at first, smooth, polished, margin striate-sulcate	crowded, light cream, linear, adnexed or free	5-6 $\times$ 1 $\frac{1}{2}$ cm. white, soft, subviscid, rugulose	white	mild; inodorous	F 8-9 $\times$ 7-7 $\frac{1}{2}$ P4	SV: blue, also in cap	Fe: pink	birch; rare
<b>66. nouseoso</b> (Pers.) Fr.	2-7 cm. thin, livid purplish pink or salmon or olive tinted, turning yellowish with brown centre; polished, peels easily	crowded or distant, cream then ochre or egg yellow with orange tinge	2-6 $\times$ $\frac{1}{2}$ -2 cm. white, often stains ochre or grey, fragile	white or greyish	mild or sl. acrid in gills; sm. faint or strong	G—H 8-11 $\times$ 7-9 P4 or 5	SV: blue, also in cap		conifers; common

*citrina* Gill.—a bright yellow form of *R. ochroleuca*.

*claroflava* Grove, 50

*consobrina* Fr., 20

*constans* (Karst.) Romell = *R. claroflava*.

*curtipes* Möll. and J. Sch., 56

*cutifracta* Cke.—it is not known to what this refers.

*cyanoxantha* (Schaeff.) Fr., 12

*decolorans* Fr., 49

*delica* Fr., 1

*densifolia* (Secr.) Gill., 3

*depallens* (Pers.) Fr.—although there is no mention of the gills changing from white to cream and the spores being ochraceous, it is not unlikely that Fries had in mind the species which later was more clearly defined as *R. exalbicans*. We have retained the latter epithet as less liable to confusion since *R. depallens* has usually been associated with *R. atro-purpurea*.

*drimeia* Cke., 32. Many authors adopt *R. sardonica* for this species, but as Fries states that the gills are white, it is preferable to retain Cooke's epithet for the species with primrose gills.

*elegans* Bres.—it is doubtful what the British record is.

*elephantina* Fr. = *R. delica*.

*emetica* Fr., 25. The various forms of this species may deserve specific rank but at present it is not clear; all that is required is to indicate the three common forms by their habitat.

*erythropus* Fr.—var. of *xerampelina*.

*exalbicans* Secr., 40

*fallax* (Schaeff.) Cke., 27

*farinipes* Romell, 15

*fellea* Fr., 21

*fingibilis* Britz. = *R. ochroleuca*.

*foetens* Fr., 16

*fragilis* (Pers.) Fr.—there is no universal agreement about this species. It is often identified with a scarlet-capped *Russula* of the *emetica* group but this can hardly be correct. Persoon described it as *pileo rubro purpurascens*; Fries in *Syst. Myc.* as *e purpureo exalbicat*. In *Hym. Eur.* Fries states that it often has an eroded edge to the gills. It seems therefore reasonable to identify the species with the small fragile *Russula* with a purplish-red or crimson cap, and gills with a fimbriate edge, which is common in Britain.

*furcata* (Pers.) Fr.—green form of *R. cyanoxantha*.

*fusca* Quel.—the British records are thought to be either *R. mustelina* or the brown form of *R. xerampelina*, probably the latter.

*galochroa* Fr. = *R. heterophylla*.

*gracillima* J. Sch., 38

*graminicolor* (Secr.) Quel. = *R. aeruginea* large form.

*grisea* (Secr.) Gill., 44

*heterophylla* Fr., 13

*incarnata* Quel. = *R. rosea*.

*integra* (Linn.) Fr., 57

*lactea* (Pers.) Fr. = var. of *R. lepida*.

*laurocerasi* Melz., 17

*lepida* Fr., 8

*leprosa* Bres. = var. of *puellaris*.

*lilacea* Quel., 43

*Linnaei* Fr.—a large form of *R. lepida*.

*lutea* Fr., 63

*luteorosella* Britz.—a form of *R. lutea*.

*luteo-tacta* Rea, 28

*luteo-viridans* Martin, 36

*mazulata* Quel., 34

*Mairei* Singer—left out for the present as it hardly appears to be distinct from *R. luteo-tacta* except for the pulverulent surface of the cap in dry weather. Some authors have used this epithet in the sense of the common beech form of *R. emetica*.

- mitis* Rea = *R. vesca*.  
*melliolens* Quel., 46  
*mustelina* Fr., 6  
*nauseosa* (Pers.) Fr., 66  
*nigricans* (Bull.) Fr., 2  
*nitida* (Pers.) Fr., 41. See note on *sphagnophila*.  
*nivea* Pers. = var. of *R. fragilis*.  
*obscura* Romell, 51  
*ochracea* (A. & S.) Fr.—usually identified with *R. fellea*.  
*ochroleuca* Fr., 22  
*olivacea* (Schaeff.) Fr., 54—left in but may be a form of *alutacea*.  
*olivascens* Fr.—placed with some doubt as a var. of *xerampelina*; the British record however requires confirmation.  
*paludosa* Britz., 61  
*pectinata* (Bull.) Fr., 18  
*pseudo-integra* Arn. & Goris., 39  
*puellaris* Fr., 47  
*punctata* (Gill.) Maire = *R. amoena*.  
*Queletii* Fr., 31  
*Romellii* Maire, 55  
*rosacea* (Pers.) Fr. = *R. sanguinea*.  
*rosea* Quel., 9  
*roseipes* (Secr.) Bres.—doubtful British record. The *roseipes* of Cooke's Illustration 1035 is *R. venosa*.  
*rubra* (Krombh.) Bres., 33—left in, but it is doubtful whether the British record is authentic.  
*sanguinea* (Bull.) Fr., 30  
*scotica* Pearson, 65  
*semi-crema* Fr. = *R. densifolia*.  
*serotina* Quel.—it is not clear what this is.  
*smaragdina* Quel., 24  
*solaris* Ferd. & Winge, 23  
*sororia* Fr., 19  
*sphagnophila* Kauffm.—this epithet was applied by Singer to a common and very variable *Russula* which grows in wet places usually under birch trees and often among *Sphagnum*. Many names have been given to this species, and it was thought that *R. venosa* would be generally accepted. The matter was re-opened by J. Schaeffer in *Ann. Myc.* xxxviii (1940) who identified it with what he considered to be the true *R. nitida* Fr. For the present it seems preferable to leave *R. venosa* Vel. as the epithet which clearly identifies this common *Russula* and *R. nitida* remains to indicate the acrid species which hitherto has been associated with this name.  
*subfoetens* W. G. Sm.—probably a form of *R. foetens*, but it is not known to what it really refers. *R. subfoetens* sensu Maire and also Melzer & Zvara is *R. farinipes*. Cooke's Ill. 1016 (1947) of *R. subfoetens* looks like *R. lauro-cerasi* Melz. and this may be adopted as the correct interpretation, but it will be regrettable if Melzer's epithet is withdrawn.  
*Turci* Bres., 59  
*Velenovskyi* M. & Z., 60  
*venosa* Vel., 64  
*versicolor* J. Sch., 42  
*vesca* Fr., 14  
*veternosa* Fr., 35  
*vinosa* Lindbl. = *R. obscura*.  
*violacea* Quel.—though marked as 'common' by Rea the authentic *R. violacea* with its peculiar smell variously described as of laudanum, cloves, etc., is rare in Britain, and the *Russula* often determined by this name is either *brunneo-violacea* or another species with a violaceous cap.  
*virescens* (Schaeff.) Fr., 7  
*virginica* Cke. & Mass.—var. of *heterophylla*.  
*viridis* Singer—var. of *drimeia*.  
*xerampelina* Fr., 52

## Citation of Authors

A. & S.	J. B. de Albertini and L. D. de	Maire.	René Maire.
	Schweinitz.	Mass.	G. Masseé.
Arn. & Goris.	Arnould and Goris.	M. & Z.	Melzer and Zvara.
Bres.	J. Bresadola.	Möll. & Sch.	Möller and J. Schaeffer.
Britz.	M. Britzelmayr.	Pearson.	A. A. Pearson.
Bull.	P. Bulliard.	Pers.	C. H. Persoon.
Cke.	M. C. Cooke.	Quel.	L. Quélet.
Crawshay.	Richard Crawshay.	Rea.	Carlton Rea.
Ferd. & Winge.	Ferdinand and Winge.	Schaeff.	J. C. Schaeffer.
Fr.	Elias Fries.	J. Sch.	J. Schaeffer.
Gill.	C. C. Gillet.	Secr.	L. Secretan.
Huds.	W. Hudson.	Singer.	Rolf Singer.
Kauffm.	C. H. Kauffman.	W. G. Sm.	Worthington G. Smith.
Krombh.	J. von Krombholz.	Vel.	J. Velenovsky.
Lindbl.	Lindblad.	With.	W. Withering.
Linn.	C. von Linnaeus.		

## FIELD NOTES

**The Barbastelle and Lesser Horse-shoe Bats at Helmsley.**—Mr. Gordon having observed a few bats leaving a crack in an old oak tree, late one evening, a second visit was paid a few days later (May 18th) in order to attempt to identify the species. On blowing smoke into the crack it was not long before the first bat emerged, to be followed by three more. Two of these, a male and a pregnant female, were caught and examined and enough was seen of the other two to make it certain that all four were Barbastelles, *Barbastella barbastellus* (Schreber). On being released they flew away among the trees with the peculiar uncertain flight of this species. A point of some interest is the fact that the sexes were not segregated as is usual with most species of bats at this season. On May 23rd a visit was paid to an old stone ruin and a single bat, believed to be a Lesser Horse-shoe, *Rhinolophus hipposideros* (Bechstein), was seen hanging from the roof in the manner characteristic of this species. It was subsequently dislodged and fell on one of us but a subsequent search, with an electric torch, failed to reveal it. On continuing the search a second specimen of this species was discovered in the same ruin and caught. This bat was subsequently released in a room where its fluttering flight was much admired. On alighting it was able to throw up its hind legs and assume the hanging position without the intermediate movements necessary to most other species. Later a window was opened and the bat quickly found its way outside.—A. GORDON and E. WILFRED TAYLOR.

**Pocklington Canal.**—In *The Naturalist*, 1946, 32-33, attention was drawn to the death of fish in this canal and to the investigation which the Yorkshire Fisheries Board intended to make into the problem. Mr. R. W. Ward, Clerk to the Board, has kindly given permission for me to quote the following from the 80th (1946) Annual Report on the Salmon, Trout and Freshwater Fisheries in Yorkshire:

'Last August (1946) an investigation of the condition of the Pocklington Canal was undertaken by the Chairman and Vice-Chairman of the Pollutions Committee along with Mr. Martin Lovett, B.Sc., who is Chief Chemist of the West Riding Rivers Board. The object of the investigation was to ascertain the amount of the oxygen content in the canal. Destruction of fish in this canal has been recurrent for a number of years, and the demise of the fish had been attributed to the scarcity of oxygen. This was borne out by the investigation, which showed the percentage of oxygen to be 0.5 parts per 100,000 parts of water, about half of the amount which the water could contain. As the canal had an influx of water from an adjoining beck a few days previous to the investigation it is possible that at times the oxygen content is lower than it was when the investigation took place.'

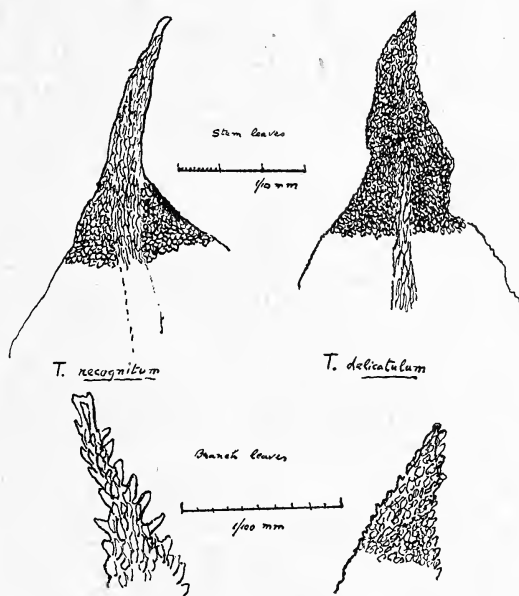
Mr. Ward, in a letter, adds that the lack of oxygen was due to the dying of excessive weed growth.—H. WHITEHEAD.



NOTES ON THE GENUS *THUIDIUM*

CHRIS. A. CHEETHAM

SINCE the issue in 1945 of the *Transactions of the Yorkshire Naturalists Union*, which dealt with Yorkshire mosses, my attention has been redirected to this genus and more particularly to *T. pseudo-tamarisci* Limpr. This is not mentioned in Dixon's *Students' Handbook of British Mosses* (1924), but he gives it as a variety of *T. Philiberti* Limpr. in his paper on *Thuidium recognitum* in the *Journal of Botany* (1913), p. 189. It was described as a new species by Limpricht in *Die Laubmoose Deutschlands*, etc. (1895). I am indebted to Mrs. Burrell for a copy of this work which throws a different light on the plant, for Limpricht, in his key, places it with *T. tamariscinum* B. and S., from which he divides it by the papillate apical cell of the branch leaves. He states that it is nearest to *T. Philiberti*, but in growth and habit more like *T. tamariscinum*, though less vigorous in growth. In a previous



paper in *The Naturalist* (1915), p. 168, I added it to our list basing my opinion on Dixon's *Journal of Botany* paper, where it is taken to be a tripinnate form of *T. Philiberti*. Recently I found a plant on Lawkland and Austwick Mosses which I had previously passed as *T. tamariscinum*, but which on examination proved to have the papillate apical cell on the branch leaf. I asked two friends for their views on the plant and one said *T. recognitum* and the other *T. delicatulum*, whilst I thought it nearer to *T. Philiberti*, but lacking the long points to the stem leaves. Now I feel satisfied that it is the plant Limpricht refers to his new species *T. pseudo-tamarisci*. The plants I called var. *pseudo-tamariscinum* of *T. Philiberti* in the Yorkshire list are tripinnate forms but not Limpricht's species. A feature of the Lawkland plant is the ochre-red or brown-red base of the stem leaves and the whole of the lower portions of the plants are more or less of this colour. This is a character given by Limpricht. The stem leaves have a recurved margin and by this and the red base are divided from *T. recognitum*, whilst the long cells at the apex of the stem leaves clearly divide it from *T. delicatulum*.

At Austwick and Ingleton the genus is plentiful and can be easily gathered and studied. Unfortunately, fruiting plants are scarce and characters based on them are of little use. The four species *T. tamariscinum*, *T. delicatulum*, *T. recognitum* and *T. Philiberti* might best be considered as four groups, for the more

that are examined intermediates are found in whatever character is taken as a base. I used to think *T. tamariscinum* stood clear with the single-pointed apical cell of the branch leaf, but I have plants which have a few of the branch leaves with papillate apical cells. Again, I used to look for a short nerve and short cells in the short apex of the stem leaves of *T. delicatulum*. I find, however, many plants with longer points and nerves but still short cells. In *T. recognitum* I looked for a smaller growth and browner colour, but I found much of this species of a larger size and greener shade. Both types have the coarser cells and papillae characteristic of the plant in my opinion. Finally, the filiform point of the branch leaves of *T. Philiberti* is sometimes reduced to a single long cell. It is thus evident that the genus is a variable group not easy to divide up into species.

The four groups may be distinguished as follows:

- T. tamariscinum* is known by the branch leaves which end in a single cell which is not papillate. The other three have papillate apical cells on the branch leaves.
- T. Philiberti* is known by the longly filiform end of the stem leaf.
- T. recognitum* is mixed with *T. delicatulum* in old records as *T. delicatulum* was not recognised in this country until 1885, all the plants prior to this date being named *T. recognitum*. They can be divided by the stem leaves, *T. recognitum* having a strong, almost excurrent nerve with long cells, whilst *T. delicatulum* has a short nerve ceasing below the apex, which has the small cells of the rest of the leaf. In the branch leaves they are divided by the cells and papillae on the back of the leaf, which are much coarser in *T. recognitum* as shown in the drawings. These were made from plants gathered at Ingleton, where both are plentiful.

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**The Scottish Naturalist**, Vol. 60, No. 1, April, 1948. Edited by V. C. Wynne-Edwards and J. W. Campbell. Oliver and Boyd, Ltd., 3/6.

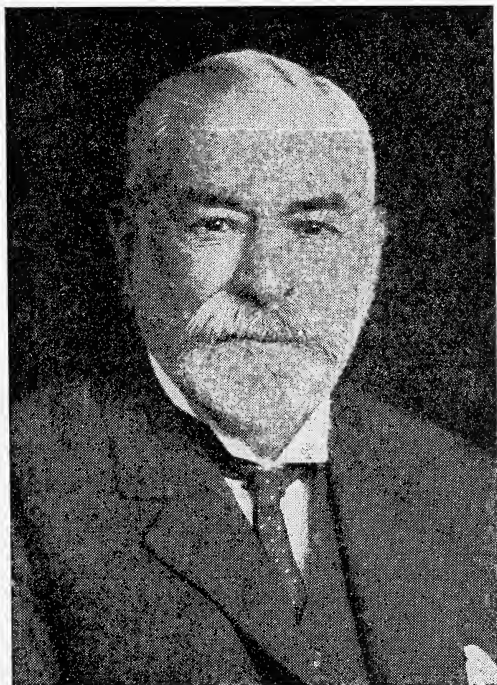
Naturalists on both sides of the Border will welcome the reappearance of this journal, the last issue of which appeared in 1939. It was first published in 1871 by the Perthshire Society of Natural Science under the editorship of Dr. Buchanan White and then of Professor J. W. H. Trail. Later it was incorporated in the *Annals of Scottish Natural History*, under which title it appeared at first three and then four times a year from 1892-1912 being edited by J. A. Harvie-Brown, Professor Trail and Dr. Eagle Clarke. The volumes issued during this period contained papers and records of the greatest interest to both botanists and zoologists. In 1912 the original title was reverted to and the magazine was subsequently devoted exclusively to zoology under the successive editorships of Dr. Eagle Clarke, Dr. James Ritchie, Mr. Percy Grimshaw and Dr. A. C. Stephens.

With the appearance of this new issue *The Scottish Naturalist* enters upon its fifth stage. The editors are V. C. Wynne-Edwards, Regius Professor of Natural History in the University of Aberdeen, and Dr. James W. Campbell, Secretary of the Scottish Wild Life Conservation Committee. It is good to know that the present revival is intended once more to serve the interests of all branches of natural history. The Scottish Ornithologists' Club has been largely instrumental in bringing about the resuscitation, and the material available for the first issue is a measure of the greater popularity of ornithology as compared with botany and entomology amongst naturalists in Scotland as elsewhere in Britain. The contents include articles on 'The Red-flanked Bluetail in Shetland: the first British Record,' by Samuel Bruce; 'Bird Territory as a "Fixed Address",' by J. M. McWilliam; 'A Century's Changes in Scottish Ornithology,' by Evelyn V. Baxter; 'The Rook Roosts of the Lothians, Winter 1946-47,' by J. H. B. Munro; 'The Magpie in North-East Scotland,' by Adam Watson; and 'The Value of Individual Marking in Birds,' by R. Carrick. There are also a score of notes and records on birds, a few on insects and one short botanical note. Book Reviews, Current Literature relating to Scottish natural history (Zoology only) and an obituary notice complete the contents. The magazine has a well-groomed appearance, lacking any suggestion of austerity. It is printed on good quality white paper with an attractive cover design and with four plates, one in colour. The publishers are Oliver and Boyd Ltd., Tweedall Court, Edinburgh 1, and the annual subscription, which will cover three issues, is 10/6, single parts 3/6, a surprisingly low rate in these days of high production costs.

## In Memoriam

FREDERICK ORPEN BOWER, Sc.D., LL.D., F.R.S., F.L.S.  
(1855-1948)

FREDERICK ORPEN BOWER came of a long-established Yorkshire family and had an almost life-long association with the county; he was born at Ripon on November 4th, 1855, and returned there on his retirement in 1925. He was President of the Yorkshire Naturalists' Union in 1928 and one of the most distinguished scientists to occupy that position. His long life is of particular interest as it bridges a period of almost unparalleled change in botanical outlook.



His interests in natural history were first aroused by rambles in the countryside around Ripon, where he spent his childhood. In 1868 he went to Repton School, where, as with most public schools of the period, the education was largely classical and mathematical and allowed of little deviation to suit the individuality of the pupils. He was happy at Repton but impatient of the lack of opportunity to study science, though he appreciated the encouragement given by the headmaster, Dr. Pears, to natural history as a hobby. Already at school he had made a collection of some 600 herbarium sheets.

In 1874 he entered Trinity College, Cambridge, where he was again disappointed to find, to use his own words, the official teaching 'moribund in summer and dead in winter,' and that it included little practical work. He gained his first introduction to a more satisfying study of plants in 1875 when the University Press of Oxford published an English translation of Sachs' *Text-book of Botany* and when in 1876 S. H. Vines was appointed a lecturer at Cambridge and proved to be an enthusiast after his own pattern. Between Part I and Part II of the Cambridge Tripos he visited Germany in the company of Vines and worked for a time under Sachs at Wurzburg. Though only a short interlude, the instruction



in laboratory methods from Sachs himself gave a tremendous incentive to further efforts at Cambridge. In 1877 he graduated with First Class Honours in Part II of the Tripos, for which he was examined by W. T. Thistleton Dyer, then Assistant Director of Kew. The simple nature of the practical examination illustrates the state of University Botany at the time; he was provided with a bean seedling from which he was asked to make preparations and drawings to show the structure of the root and he was also asked a few questions on the Characeae. In the same connection he records that in 1874, Vines, already a graduate of London University with Botany as one of his subjects, had never seen a microscopical preparation of any part of a plant! In 1877 he saw the conferment at Cambridge of the Honorary Doctorate of Laws upon Charles Darwin, five years before Darwin's death.

On leaving Cambridge in 1879 he went to work under de Bary at Strassburg, where Vines and D. H. Scott were also studying. These young British botanists were much inspired by the continental outlook, the aim of which was the study of *living* plants. At home the subject was almost confined to systematic work on flowering plants carried out largely on herbarium specimens, a state of affairs which Bower ascribes to the expansion of the Colonial Empire and the need to examine its resources.

In 1880 Bower became Assistant to Professor Daniel Oliver at University College, where he was in charge of the practical work and drew up schedules of instructions which formed the basis of later books on Practical Botany.

On account of the very backward state of Biology in England at this time, the country was quite unprepared for the Education Act of 1870 which included elementary science in the curriculum for Government Schools. Courses for teachers were started at the Normal School of Science at South Kensington under the Dean-ship of T. H. Huxley, with whom Thistleton Dyer and Vines became associated as botanists. The earlier courses were limited to a few weeks in the summer and for these the help of Bower and other demonstrators was enlisted, but in 1882 the training was put upon a more permanent basis and Bower was appointed as lecturer. The practical work in which lecturers and students were striving together to confirm for themselves the facts of the life-cycles which had been worked out mainly by Hofmeister and his followers on the continent, to examine plant structure and to implant upon their observations a simple approach to the linking of form and function, was evidently invigorating beyond measure.

From 1880 to 1885 Bower found that between his teaching duties he was able to spend a considerable time working at Kew, where Sir Joseph Hooker placed bench space in the Jodrell Laboratory at his disposal; a number of interesting problems were passed to him and amongst other material he examined *Phylloglossum*, seedlings of *Welwitschia*, aposporous material of *Athyrium*, and carried out developmental studies upon leaves. This was an extremely happy time in his life and he found the encouragement afforded by Sir Joseph Hooker and Thistleton Dyer, and his association with D. H. Scott and Walter Gardiner as fellow workers in the Jodrell Laboratory most inspiring. One gathers that it was with great regret that he left this atmosphere in 1885 at very short notice to take up the Regius Chair of Botany at Glasgow on the strong recommendation of the Kew authorities.

At the age of 29 he found himself in charge of the Botany Department of a University run on almost mediaeval lines. He had one assistant and it was the personal responsibility of the professor to defray the expenses of the Department from students' fees. Fortunately his immediate predecessor, Professor Isaac Bayley Balfour, had made a start on teaching botany along practical lines and two small rooms were available for this purpose. The class consisted of some 200 students for elementary botany and the difficulty of managing so large a class with such meagre assistance, space and equipment and with only three weeks in which to reorganise the course must have been a formidable prospect for a young lecturer. In the autumn it came as a surprise to him to find that he had no obligation for teaching during the winter months. The first winter he visited Ceylon, but in subsequent years he spent much of his time at Kew. From 1889-93 the administration of the Scottish Universities was reorganised along more modern lines and a Faculty of Science was instituted which laid down regulations for graduation with Honours in Science. This meant that the Professor had heavier teaching responsibilities throughout the year and Bower's subsequent work was carried out in Glasgow.



From the first his interests had been caught by the lower, and particularly by the archegoniate plants. He and D. H. Scott had both been in close contact with the palaeobotanical work of W. C. Williamson at Manchester, and about 1889-90 it had been largely a matter of mutual arrangement that D. H. Scott should take over much of the material in process of study by Williamson, whilst Bower should work on living plants. The continued association with the work of D. H. Scott and later with D. T. Gwynne-Vaughan and W. H. Lang, both of whom worked at Glasgow, and with the distinguished amateur botanist R. Kidston, led to the inclusion of both fossil and recent representatives in his survey of the lower plants in *The Origin of a Land Flora* (1908) and *Primitive Land Plants* (1935). Bower's main interests centred on the ferns and the close study of this group led to the publication by Cambridge University Press of *The Ferns* (1923-8). The wealth of structural and developmental detail accumulated in these three volumes is immense and has laid a valuable foundation for his phylogenetic arrangement of the ferns. During the Glasgow period he also published books on Practical Botany in collaboration with Vines and later with Gwynne-Vaughan, *Botany of the Living Plant* (1919) which ran into several editions, and *Size and Form in Plants* (1930).

In the Glasgow Department he was an inspiring lecturer and a keen leader on field excursions. He also took an active part in general University affairs as a member of the Senate, of the Court and in the honorary office of Dean of Faculties.

A comparison of the Glasgow Department as it was when Bower was appointed to the Chair in 1885 with the large and vigorous Department from which he retired in 1925, makes one realise the kaleidoscopic changes through which Botany passed during his professional life and the still further progress that he saw during the 23 years after his retirement. Born before the publication of *The Origin of Species* in 1859, he witnessed the struggle between the doctrines of Special Creation and Evolution. He grew up in a period when a child with a strong bent for natural history found no guidance, when a student at Cambridge had virtually no introduction to practical botany and, if intent upon making botany his life's work, was almost obliged to seek training in one of the continental Universities. Bower was numbered among the band of enthusiastic students to whom we owe the revival of Botany in this country. He saw its astonishing expansion from the dry bones of undiluted systematics into a vital subject embracing its many modern branches. As he was himself a witness of so many of the great advances, he had a clearer grasp of the developments that were taking place in the subject as a whole than many of the present-day botanists who have specialised in one branch almost from graduation. He met in his day many of the great scientists whose works are the classics of one or other of the many branches of botany, such as S. H. Vines, A. de Bary, A. Weismann, H. Marshall Ward, Saporta, Williamson, Solms Laubach, Pringsheim, Treub, Schimper, Errera, Klebs and others. He had occupied the Chair at Glasgow fifteen years before the discovery of Mendel's papers in 1900 and watched the resulting advance in genetics. The contrasts between the beginning and the latter part of his active life are vividly described in his book *Sixty Years of Botany in Britain, 1875-1935*, which was published in 1938.

He was President of the British Association in 1930 and on three occasions President of Section K, where he and D. H. Scott were usually seen together and were familiar figures to all. Their enthusiasm seemed to dominate the Section. His achievements were acknowledged by the conferment of many Honours, amongst which were Honorary Degrees by Aberdeen, Bristol, Cambridge, Dublin, Glasgow, Leeds and Sydney, and the award of the Royal Medal and the Linnean Medal in 1901 and the Darwin Medal in 1938.

Professor Bower had a live and vivid personality. In appearance he was a fine man, with Edwardian beard, well groomed and with old-fashioned courtliness of manner. He was an eloquent speaker and in both the written and the spoken word he paid particular attention to the purity of the language. His Presidential Address to the Yorkshire Naturalists' Union at York in 1928 dealt with the evolution of the ferns and on re-reading it in *The Naturalist* one realises that it is a model of a well-constructed lecture in which his vast knowledge of the ferns is condensed to a concrete whole and carefully adapted to a general audience of Yorkshire listeners and also that exceptional attention has been paid to style and form.

He had many interests outside his work, but chief amongst these should be mentioned his love of music. He was a skilled 'cello player and tells how as a

student at Cambridge he, with a group of friends, started a series of weekly chamber music concerts, which were so well received that they proved a financial success and were the forerunner of the present Cambridge University Musical Club. To the end he maintained this interest and was a regular supporter of musical events in Ripon. The last time I saw Professor Bower was in Ripon in the summer of 1946; he was over 90 but had changed little and had the same wealth of animated conversation. His rooms in the old Deanery looked out on the Minster and his favourite prints on the walls and many books provided the right setting for him. After a short illness he died on April 11th, 1948, the funeral service being held in the Minster that he loved and supported so well.

L. I. SCOTT.

## WHITE-TAILED EAGLE IN NORTH-EAST YORKSHIRE IN 1948

R. M. GARNETT

A VISIT of about a month's duration paid by a white-tailed eagle (*Haliaeetus albicilla*) to North-east Yorkshire seems worthy of a special note in *The Naturalist*. The bird was first seen on January 20th (R.M.G.) when it was flapping about at a very low altitude amongst the many waterfowl collected on flooded ground beside the river Derwent at Thornton Marishes, and it was seen again next day by two farmers who were threshing a stack in the same locality.

The next news of it came in an excellent description sent by Mrs. Mercer of Low Staindale Farm who, with her husband, saw it near The Bristonstones, a recently acquired property of The National Trust, on January 28th. It was subsequently seen on many occasions by many others, including a number of experienced ornithologists, a party of whom found a roost on February 8th in a sheltered ghyll near to The Bristonstones. Some pellets, one a very fresh one on which some staph beetles were preparing to breed, were sent to the Yorkshire Museum. Mr. Wagstaffe wrote that identifiable material consisted of sheep's wool and the feet and feather remains of a partridge.

Its usual line of flight in the morning was from the roosting area down Thornton Dale to Ellerburn and over the south side of the dale into the Vale of Pickering, returning in the afternoon.

On January 30th it was seen by F. Dunning, a gamekeeper, at Ellerburn fish-pond, when it came to blows with a mute swan resting on the water. The ornithologists who saw it are agreed that it was an immature bird, and the following notes on its field characteristics are compiled from observations made by C. E. A. Burnham, M. F. M. Meiklejohn, and A. J. Wallis, who have kindly sent me their notes.

General plumage dark brown below with almost black flight feathers and wholly dark brown tail. Mantle speckled golden brown so as to give general light appearance. Light patches on sides of neck. Under-wing coverts lighter than primaries. Beak very thick vertically and pronounced forehead. Tarsus appeared bare when legs were twice lowered in flight (M.F.M.M.). When gliding the emarginated flight feathers appeared of equal length, giving a vulture-like outline. Tail very short, fan-shaped when open, wedge-shaped when closed.

It was last seen on February 17th by W. Hoggard, the warrener, over Dalby forest, and is believed to have escaped molestation.

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**A Child's Biology**, by **Brian Vesey-Fitzgerald**. Pp. 144 with 54 drawings by L. R. Brightwell. Cassell & Co., 8/6.

Collaboration between such a versatile naturalist and writer as Mr. Vesey-Fitzgerald and such a skilful draughtsman as Mr. Brightwell could hardly fail to produce an interestingly written and attractively illustrated book. It aims at giving an account of the nature of living things and an outline of the chief groups of plants and classes of animals. This is done in simple terms and short sentences well adapted to the requirements of its intended readers. It is sound in substance and admirably straightforward in presentation while the excellent drawings constantly stimulate interest. This book is strongly recommended as eminently suitable for juvenile readers though they may have some difficulty at first in inducing their parents to part with it.

## ORNITHOLOGICAL REPORT FOR NORTHUMBERLAND AND DURHAM FOR 1947

Compiled from the records of members of the Ornithological Section of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne and other observers, by GEORGE W. TEMPERLEY, M.B.O.U.

(A key to the initials appearing in this Report will be found at the end of these notes. Abbreviations : N=Northumberland ; D=Durham ; B.B.=*British Birds* ; O.R.=*Ornithological Report*.)

The use of the numbers with the English names employed in Witherby's *Handbook of British Birds* has been adopted to save the space of printing the scientific names.

Where reports of rare birds are placed in square brackets it is implied that, being sight records only, some slight element of doubt exists as to the accuracy of the identification. Such reports are included for the information and guidance of other observers, who should in future be on the look out for the species.

The number of observers with whom we are in correspondence is now over 130, of whom 85 have contributed to this year's Report. Owing to the abridgement of the Report for publication many interesting notes have had to be omitted, but all have been of value to the compiler who is most grateful to the observers. New contributors are welcome, particularly from outlying districts. All notes should be addressed to George W. Temperley, Hancock Museum, Newcastle upon Tyne.

It will greatly help the compiler if observers will :—

- (a) Classify their notes by arranging them in the same order as they appear in this Report.
- (b) Send notes at more frequent intervals, quarterly, or even monthly.
- (c) Write on one side of the paper only.
- (d) Give full details of the characters by which rare and not easily recognised species were identified in the field.

Records of unusual interest dealt with below are :—the occurrence of a Rose-coloured Starling (16), a Golden Oriole (17), a Red-breasted Flycatcher (125), a Hoopoe (232), the breeding of a pair of Montagu's Harriers (272), the occurrence of a Common Kite (278), a Black Kite (279), a Spotted Crake (505), and the summer influx of Quails (520).

### WEATHER CONDITIONS IN 1947

#### *Winter*

The severe weather of the winter of 1946-47 did not begin until January 26th when it was ushered in by a south-east wind and flurries of snow. On January 29th and 30th snow fell again and frost increased. All the exposed inland waters, loughs, reservoirs and ponds, were frozen over and many streams were ice-bound. During the first week of February snow fell on several days and the whole countryside was buried under a thick mantle which was to lie for over six weeks. In exposed places drifts of 10 feet or more deep were frequent. The cold increased towards the end of February and in the first week of March some of the lowest temperatures of the winter were recorded. At Simonburn on the North Tyne where frost was recorded every night from January 19th to March 16th, the lowest temperature was reached on March 3rd when 45 degrees of frost were registered. Heavy snow fell again with blizzards and much drifting, which continued until March 13th or 14th. On the 16th the temperature suddenly rose and a rapid and continuous thaw set in.

The first effect of the snow was to drive away the Fieldfares and Redwings, which had been unusually numerous during the autumn. Most of the former left the district, but some of the latter resorted to the coast where they were seen feeding along the tide-line, others sought shelter in towns and villages where many were picked up exhausted or dead.

Waxwings, of which there had been a large incursion in November, soon disappeared. As the rivers became ice-bound, Dippers, Kingfishers and Grey Wagtails were no longer to be found. Roving bands of Tits, Creepers and Goldcrests disappeared from the woods. Song-thrushes and Mistle-thrushes, even those which were wintering in sheltered gardens, were killed off, together with many Robins and Hedge-sparrows. Of garden birds, Blackbirds survived best, though many



succumbed. Finches gathered about farmsteads and stackyards, but even these flocks dwindled as the storms continued. On the moorlands Grouse suffered severely. They were driven by starvation to leave the shelter of the now hard-frozen snow and were seen flying far afield in search of food. One gamekeeper reported that when, by great exertion, he was able to clear a few square yards of heather, he later counted 58 grouse upon it.

Inland, owing to repeated snow falls and the presence of large numbers of Carrion Crows, dead birds were not found in any quantity; but along the shore signs of the heavy mortality due to the storms were everywhere. The beaches were littered with the battered and often oil-soaked bodies of sea-birds which had been washed ashore dead or dying. These included numbers of Gulls, Gannets, Cormorants, Shags, Guillemots, Divers and Grebes, with many surface-feeding and diving Duck and a few Whooper Swans. A few Puffins and Little Auks were also found. During the periods of hardest frost many waders were found dead on the shore, for the mud-flats and rock-pools froze as soon as they were uncovered by the tides. Lapwings and Golden Plover, which had come down to the shore, perished in numbers. The only species on the coast which did not suffer were the larger Gulls and the Carrion Crows which found abundant food. One observer counted 161 identifiable dead birds belonging to 38 species, chiefly between the rivers Tyne and Wear; but very many more corpses were buried under the masses of seaweed cast up along the beaches.

When the storms were at last over, the absence of birds was most marked. Until the arrival of the summer migrants the woods were empty and silent and the hedgerows deserted, while few birds were to be seen along the streams. Red-shanks and Snipe were fewer in number in most of their usual haunts. Amongst the species which suffered most severely may be mentioned the Long-tailed Tit, which for some years had been unusually numerous, Coal-tit, Creeper, Goldcrest, Common Wren, Dipper, Kingfisher and Little Grebe.

Rooks took little heed of the weather; they were seen building as early as March 4th, in spite of one of the hardest frosts of the winter, and continued to do so steadily through the heaviest snowfalls on the 13th and 14th.

### *Spring*

Migrants arrived at about their usual times, the first Wheatear was reported on March 24th while thick drifts of melting snow still lay on the ground in many places. The first Willow-warblers were quite as early as in the previous year and there is a particularly early record of a Sand-martin. Some species were not up to their usual numbers, notably Pied Flycatchers and Wood-warblers.

### *Summer*

A very fine summer was favourable for the breeding of both resident and immigrant species; but the former were so few that but little recovery in their number was noted and with the departure of the migrants the woods and gardens were again markedly deserted. A good year for heather has improved the condition of Grouse, which for some years had been suffering from disease, and in the autumn, packs, though few and small, were composed of strong and healthy birds. Partridges did badly on the higher ground, coveys being few and far between, but there was some recovery on the low lands.

### *Autumn*

The autumn was an uneventful one. The usual movement of waders passing along the coast was hardly observed. Few Grey Plovers, Ruffs or Whimbrels put in an appearance and Greenshanks were seldom reported. There were no Stints or Curlew Sandpipers, both of which had been unusually numerous in the previous autumn. Wintering Bar-tailed Godwits, Knots and Purple Sandpipers were fewer in number than for many years past and even the flocks of Dunlin were markedly smaller. Such movements of passage waders as were noted occurred early in the season.

### WILD FOWL RESORTS

It is disappointing to have to report that wild-fowl resorts in County Durham are rapidly becoming fewer owing to the draining or filling in of marshy land and flooded fields. The pond in North-east Durham, frequently referred to in this



and previous Reports as the haunt of unusual birds, is being filled in by the dumping of rubbish; while the breeding haunt of the Black-necked Grebe is suffering a like fate. Parts of the Tees Estuary are being 'reclaimed' for factory sites and in other places flooded fields, caused by 'pit creeps,' are being covered by colliery refuse heaps.

#### TITS OPENING MILK BOTTLES

During the year a questionnaire was circulated to our members requesting information concerning this habit. Only ten replies were received; all from the lower Tyne and Derwent Valleys. These agreed that only Blue and Great Tits had so far been observed to indulge in this habit; four accused both Blue and Great Tits, while five accused Blue Tits only. The earliest dates on which the habit had been observed were 1931 at Ryton, 1932 at Stocksfield and Rowlands Gill, 1933 at Shotley Bridge. In 1932 a photograph appeared in the 'Newcastle Journal' showing a Blue Tit removing a card disc from a milk bottle at Stocksfield. At that time, fifteen years ago, the use of bottles for milk delivery was not so general as it has since become. Both cardboard and metal tops are removed, sometimes whole and sometimes in torn fragments. In some cases as much as an inch of cream has been taken. One report states that the Tits were first attracted by the wax on the card discs which they stripped from both sides of the discs. It was not until later that they discovered that cream was obtainable from below the discs, which they now merely remove and discard. In Stocksfield, Tits have been seen following the milk lorry along the roads and attacking the bottles thereon while the milkman is away delivering the milk at the house doors.

#### CLASSIFIED NOTES

1. RAVEN.—Cheviot site: on April 6th a pair was seen and a nest located with six eggs (J.D.T.) and on August 24th six birds were seen together on the north slope of Cheviot (P.C.H.). Simonside site: early in the year a pair was seen at this site (H.S.T.) and on April 4th one was seen to leave the nest (J.D.T.), but no young were reared (B.P.H.). At another site a pair of birds and a nest with eggs was seen (J.D.T.). Sweethope site: on April 12th a pair was seen and a concealed nest located; on the 27th young birds were heard hissing in the nest (J.D.T.). In Upper Teesdale none bred; but further west, just outside our limits, a pair bred successfully. This may have been the pair which normally attempts to breed in Teesdale, their usual nesting site being untenable owing to the easterly blizzards (H.W.).

2. HOODED CROW.—Many observers reported small numbers seen on the coast. Odd birds remained well into the spring; one being seen on Holy Island Sands as late as May 2nd (F.B.). In autumn and winter some were reported well inland. On October 28th a flock of 18 birds was seen near Chester-le-Street, D. 'For many years in this locality I have not seen more than three in any one year' (J.W.).

3. CARRION CROW.—In January a large 'roost' was established at Prestwick Carr, N. from 50 to 60 birds were counted (M.W.R.). In November a roost assembly of 69 was counted at Gosforth Park, N., and another numbering 58 near Twice-Brewed, Fourstones, N. (J.R.C.).

A pair again attempted to breed on the Farne Islands; this year on the top of the tower on the Brownsman. It was not discovered until the 'watchers' went out, by which time one young had been hatched (T.R.G.). 'About Bothal, N., unusual numbers nested; most of the untrimmed hawthorn hedges contained nests, sometimes in twos and threes fairly close together' (R.C.).

4. ROOK.—At Berwick Rooks began building on March 4th in spite of one of the hardest frosts of the winter and continued through the heaviest snowfalls on the 13th and 14th (F.B.). At Bothal, N., in spite of severe weather, birds were repairing old nests as early as March 18th (R.C.).

11. JAY.—In August, 1947, a bird was recovered at Blagdon, N., where it had been ringed in September, 1944 (M.W.R.).

14. STARLING.—In February a large roost was discovered near Moulton, North Yorks. Large flocks have been seen passing over Darlington, D., in the direction of this roost, indicating that birds gather from a distance of well over seven miles from the roost (J.B.N.). In March, thousands of birds congregated each evening in a field between Ashington and Bothal and roosted in a wood nearby

(R.C.). On July 13th a flock of approximately 10,000 was seen to settle on a Cheviot hillside (F.B.). On October 25th at Goswick, N., a flock estimated to consist of 20,000 birds was seen, as well as other smaller flocks elsewhere (F.B.). The severe weather appears to have made no impression on the numbers of this species.

16. ROSE-COLOURED STARLING.—On August 25th on Beal Shore, N., an immature bird of this species was seen amongst a flock of Common Starlings. 'Head, light brown; breast and mantle, pale sandy-buff; closed wing almost black with spotted effect caused by light-edged feathers; bill, yellow, shorter and blunter than Starling's' (F.B.). This is the first local record for several years. Until about 50 years ago, odd birds were more frequently recorded.

17. GOLDEN ORIOLE.—On May 6th a cock in fine plumage was picked up dead on Holy Island, N., by J. Brigham of St. Coomb's Farm. It is now in the Hancock Museum.

18. HAWFINCH.—In March, six or eight birds were seen at Blagdon, N., and later two nests were found (M.W.R.). On August 27th a young bird was found in a vinery at Otterburn Tower, N. (W.T.R.).

20. GOLDFINCH.—Now fairly common and breeding in the Cornhill area, N. (A.M.P.). Doing well at Glanton, N., 'never seen here until a few years ago' (N.R.). A pair bred successfully near Allenheads (G.A.). Breeding near Darlington and Hartlepool (J.R.C.).

In January a flock of 20 to 30 birds spent some weeks near Haydon Bridge (W.J.). On October 19th close to the shore at Beadnell, N., a flock of 25 to 30 and other scattered parties about the village at the same time. 'Though fresh arrivals they appeared to belong to the British sub-species' (S. & J.S.A.).

21. SISKIN.—Very few records. On February 16th a flock of 12 near Netherwitton, N. (J.D.T.). On the 20th a flock of nine near Warkworth, N. (A.E.G.). On March 22nd a flock of 50 was feeding on a patch of bare ground from which snow had melted near Middleton-in-Teesdale (H.W.). None reported in the autumn.

23. MEALY REDPOLL.—On March 5th a party of four at Jarrow Slakes, D., 'very hoary and with conspicuous whitish wing-bars, feeding on seeds of scurvy-grass' (J.R.C.). In March a bird was reported near Holy Island crossing and was still there on April 3rd' (F.B.).

25. LESSER REDPOLL.—Very few reports of residents or immigrants.

29. TWITE.—On October 21st at Teesmouth, D., one seen (J.R.C.). The sole record for the year.

36. COMMON CROSSBILL.—At Dipton Wood, N., on April 9th, a pair of birds was observed. The hen, with a cock in attendance, was building a nest some 20 feet from the ground in a pine tree. On several occasions until April 30th one or both birds were seen (A.J.C.). The site was not revisited until May 11th when no birds were seen or heard. The nest could not be reached so no proof of successful breeding was obtained (G.W.T.).

42. BRAMBLING.—Fewer than usual reported in the autumn.

43. CORN-BUNTING.—A numerous resident in the Forest Hall area, N. (M.G.R.). Noted in breeding season at Benton Square, Hartley, and Cowpen, N. (H.R.O.). Very uncommon at Blagdon, N. (M.W.R.).

59. SNOW-BUNTING.—On January 18th and 25th a small flock at Seaton Carew, D. (P.M.). In mid-February a few near Middleton-in-Teesdale, D. (H.W.). On March 20th three at Alnmouth (H.T.). More plentiful than usual at Teesmouth at the end of the year, on November 14th about 30 and on December 1st 85 (O.C.H. and J.R.C.). On November 16th one at Marsden and one at Trow Rocks, D. (F.G.G.). On October 6th, six or seven on moors near Middleton-in-Teesdale (H.W.).

81. ROCK-PIPIIT.—At Goswick, N., on November 29th, 25 birds amongst sand-dunes 'almost certainly immigrants as none normally seen here' (F.B.).

88. YELLOW WAGTAIL.—May 7th at Alnmouth, N., two (H.T.). On September 2nd towards dusk, on the banks of a pond in north-east Durham, a very large flock was observed: 'Standing at one corner of the pond I counted 35 birds visible to me at one time; others, uncounted, were picking about amongst the rushes and more distant areas of the pond's margin were also occupied as was apparent when I walked round' (F.G.G.).

89. GREY WAGTAIL.—A very scarce bird after the severe weather. Missing from most of its usual haunts during 1947.

91. WHITE WAGTAIL.—On April 18th two cocks at Longhoughton, N. (K.I.). On April 26th five at Cowpen Marsh, D. (P.M.). On April 26th, one cock on the beach at Berwick (F.B.). On April 27th, two at Boulmer, May 2nd, nine, and May 4th, four at Alnmouth (H.T.). On September 8th a juvenile at Alnmouth (H.T.). On September 6th a cock in north-east Durham and on the 12th and 19th an adult cock on the Don near Jarrow (J.R.C.).

93. TREE-CREEPER.—A very scarce bird after the severe weather.

96. NUTHATCH.—At the end of January a pair was seen on three occasions just south of Durham City (J.L.C.). On May 3rd one was seen in Darlington South Park (M.G.R.) and on August 30th a family party of five was seen there (J.R.C.). Bred again near Middleton-in-Teesdale (H.W.).

98. GREAT TIT.—Reduced in number but not seriously affected by the winter. In nesting boxes in the Forestry Commission's plantations, larger clutches of eggs were noted than in previous years. 156 young were reared from 20 boxes; there being three clutches of 11 eggs and two of 12 (M.F.A.).

100. BLUE TIT.—In nesting boxes, referred to above, five pairs laid 51 eggs and reared a total of 44 young; one pair reared a family of 14 young (M.F.A.).

102. COAL TIT.—Noticeably fewer in the autumn and winter of 1947. Its absence from flocks of mixed Tits was remarked upon by several observers.

108. WILLOW TIT.—Very few reported since the severe winter. On March 26th only one at Prestwick Carr, where they were previously seen frequently and none at Gosforth Park (J.A.M.).

Seen and heard later in Gosforth Park, where a previously undiscovered nesting excavation was found in a birch stump (S. and J.S.A.).

August 3rd a pair seen feeding young near Craster, N. (J.M.C.). Distribution in Northumberland.—Mr. P. A. Clancey supplies the following interesting note: 'During the first six months of 1942 I was stationed at Rothbury and Longframlington and at that time I found this species to be very thinly distributed in suitable localities of the valley of the river Coquet, while birds observed during the third week in April near Brinkburn Priory in roadside alders were quite definitely preparing to breed. In the Coquet valley the species appeared to be restricted to a riverain habitat during the breeding season and on the higher ground in neighbouring districts it was not to be found.'

111. LONG-TAILED TIT.—Observers comment on the small numbers seen since last winter. Very few family parties in the autumn.

120. WAXWING.—As the result of the 'invasion' in the autumn of 1946, already reported (*O.R.*, 1946), Waxwings were widely scattered over both Counties at the opening of the year 1947. The flocks had broken up and most of the reports were of odd birds or of two or three together. After the onset of the snow and severe weather at the end of January few were seen and several were picked up dead. The only considerable flock reported was one of 40 birds seen south of Hexham on February 6th (T.F.H.); and from February 10th to 18th several were seen in parks and gardens in Darlington (J.B.N.). The last bird reported was one seen at Cleadon, D., on March 3rd (F.G.G.).

The sole records for the autumn of 1947 are a small flock of eight or ten seen near Whitley Chapel, south of Hexham, quite early in the autumn (Launcelot E. Smith) and two seen at East Bolton, west of Alnwick, on December 8th (E.M.).

121. SPOTTED FLYCATCHER.—In many districts noticeably fewer than for some years past.

123. PIED FLYCATCHER.—Not so numerous as usual in some districts. In the plantations of the Forestry Commissioners, 38 pairs nested in nesting-boxes and reared 216 young. Of a large number of young birds ringed in 1946 not one was recorded as having returned to breed in the following year (M.F.A.). September 16th to 20th, in misty weather, odd birds seen on Holy Island (H.R.O.).

125. RED-BREASTED FLYCATCHER.—On October 24th, a day of continuous drizzle, cold east wind and rough seas, I was on Whitburn Bents when I observed a small, slim bird moving in and out of the observation slits in a concrete "pill-box" constructed during the last war just above high-water mark. When perched its movements were wren-like and when it flew it made typical flycatcher sallies, returning to the pill-box near which I stood. In flight its most striking character was the unique pattern of its tail—a long rectangular patch of white set on each side for threequarters of the tail's length contrasting with the dark brown central rib and terminal portions. Its upper parts were plain olive brown, under parts



buffish white, lighter under the tail. I had no difficulty in identifying it as a Red-breasted Flycatcher, no doubt a bird of the year' (J.R.C.). This is the first record for County Durham. Nine specimens have occurred in Northumberland, all but two on Holy Island (G.W.T.).

127. **GOLDCREST**.—Very scarce indeed after the severe winter. No reports of breeding received. Less numerous than usual in autumn and winter.

129. **CHIFFCHAFF**.—More records than usual this year. On March 23rd, when snow had scarcely disappeared, one was seen in the yard of Craster South Farm; later, the same or another bird was heard singing. 'This is the first I have ever seen here in spring: I hear one occasionally in autumn, usually in September' (W.S.C.). One heard in April and again in June at Blagdon, N., possibly bred (M.W.R.). One heard and seen in the north-east portion of Dipton Wood, N. (R.G. and E.M.L.). On July 13th one heard on the Banks, Durham City (J.L.C.). On August 31st one heard singing strongly in woods near Shotley Bridge, D. (I.R.E.). On September 17th one was heard in a garden at Whickham, D. (S.E.C.). On September 20th one was heard in full song at Cleadon, D., 'the first I have ever identified in the area' (H.M.S.B.). 'Despite their presence at Alnwick Park, they are extremely rare round Glanton, but one was heard singing in woods near Glanton on September 18th, obviously a wanderer' (N.R.).

135. **WOOD WARBLER**.—Common in Jesmond Dene, Newcastle, early in the season but apparently not remaining to breed (G.C.V.). None in their usual breeding places about Warkworth this season (A.E.G.).

145. **GRASSHOPPER-WARBLER**.—As showing the changes taking place in bird distribution, C.H. writes from High Horse Close near Rowlands Gill, D., 'the Grasshopper-Warbler has gone from my district. It has nested in the woods near my house for the past 24 years until about three years ago.'

164. **LESSER WHITETHROAT**.—On May 30th one was heard and seen at the north end of Jesmond Dene; on subsequent visits it was not found (G.C.V.). On June 17th a cock was heard persistently singing from an island in Axwell Park Lake, D.; possibly breeding, but no mate seen (G.C.V.). In June one was heard singing in the grounds of Craster Tower, N., and another near Little Mill Station (W.S.C.).

173. **FIELDFARE**.—Flocks certainly fewer and smaller in the autumn. This may well be due to losses suffered during the previous severe winter.

174. **MISTLE-THRUSH**.—In most districts almost wiped out by the severe winter. Not one seen near Alnmouth since the frost (H.T.). Very scarce indeed at Stocksfield (G.W.T.).

175. **SONG-THRUSH**.—Thinned out seriously; but recovered somewhat during the favourable breeding season.

178. **REDWING**.—Many destroyed during the winter. Autumn flocks few and small.

182. **RING-OUZEL**.—From about May 18th to mid-June a hen bird was observed on the Brownsman, Farne Islands (T.R.G.). On October 27th 'at least one in "the lonnen" at Holy Island' (H.R.O.).

184. **BLACKBIRD**.—Can survive severe weather better than most of the Thrush family. Reduced in numbers, but still fairly plentiful.

In May a Blackbird laid four eggs on a concrete path in a garden at Bothal, N. There was no attempt at nest-building; the eggs being laid on the path amongst a few pea-sticks. Unfortunately, the eggs were taken, so it is impossible to say whether the bird would have attempted incubation (R.C.).

186. **WHEATEAR**.—First recorded March 24th at Berwick (F.B.). In mid-April freshly arrived flocks were recorded in the Breamish and Alwin Valleys (W.H.B.). On June 28th one was seen feeding fledged young on the pit-heap of Rising Sun Colliery, Wallsend, N. (M.G.R.). On the north-east Durham coast parties of young on passage from their breeding grounds appeared as early as June 13th (H.M.S.B.). On September 3rd from 12 to 18 were seen about the Whittle Dene Reservoirs, N. (T.F.H.).

187. **GREENLAND WHEATEAR**.—On May 6th, at Alnmouth, an outstandingly large bird with pinkish buff breast and buff underparts was recognised as being of this sub-species (H.T.).

198. **STONECHAT**.—Now a rare bird in our counties. At Alnmouth a pair was seen in the last week in March and a single male on April 9th, but none thereafter (H.T.) until December 20th when a pair was reported and a single cock on December



24th (E.F.T. per H.T.). One near Blagdon on April 13th (M.W.R.). None between Amble and Alnmouth (A.E.G.). A cock on the links near St. Mary's Island on February 16th and again on March 2nd, but not seen subsequently. No other records (H.R.O.).

202. BLACK REDSTART.—Is becoming a regular winter visitor on our coast. From February 10th to 14th a hen bird was seen near South Shields on the same spot as in 1945 and 1946 (J.R.C.). On March 19th a hen, or young cock, arrived at Alnmouth; on the 24th it was joined by two adult cocks; it was not seen after this date, but the two cocks stayed until March 31st (H.T.). On March 24th a hen was seen on Berwick beach, but not subsequently (F.B.). On March 27th and 28th a hen was seen on the links near Carr Rocks at Warkworth, N. (A.E.G.). On December 14th an adult cock and an immature cock were seen separately on the shore near St. Mary's Island, N. They were seen again on the 15th and one or other, but not both, were seen on the 21st and 28th. The adult cock remained until January 18th, 1948 (H.R.O., W.E.O., and R.D.S.).

208. ROBIN.—Suffered severe losses during the winter; from which it has not yet recovered in spite of a favourable breeding season.

211. HEDGE-SPARROW.—Thinned out everywhere during the severe winter. On October 16th at Gosforth one was watched hopping on to the stems of Iceland Poppies bearing seed-capsules, edging along the stems until the capsules were inverted and the seeds fell out and then flying down to eat them (S. and J.S.A.).

213. WREN.—Judging from the scarcity of this species following the severe winter, the losses must have been very heavy. None seen in South Gosforth in 1947 (J.G.G.). None noted about Heworth (C.J.G.). None seen this year in the Stocksfield district (G.W.T.). In Alnwick district nearly wiped out; but showing signs of recovery (J.E.R.).

On April 1st at Gosforth Park four dead Wrens were found in an old nesting hole of a Willow-Tit; evidently killed by cold when roosting therein (S. and J.S.A.).

218. DIPPER.—Very scarce indeed. None seen since the severe winter on the river Tyne or its tributaries in the Stocksfield area, where it is normally a regular resident (G.W.T.). At Alnwick, very few seen since the winter (J.E.R.).

222. HOUSE-MARTIN.—In September exceptionally large gatherings were noted. At Glanton, N., up to over 600 birds were seen together on wires (N.R.). Like other summer migrants they benefited from the long fine summer.

223. SAND-MARTIN.—'I saw one at Alnmouth on March 25th, a very early date, and it is interesting to note from the Report of The Norfolk Naturalists' Trust that five were seen on March 22nd in that County' (H.T.).

At Beadnell, N., on June 26th a bird was watched in flight which had two elongated tail feathers extending some three inches beyond the normal tail, giving it an extraordinary appearance, but not impeding its flight (S. and J.S.A.).

225. SWIFT.—First seen on May 7th at Forest Hall, N. (M.G.R.), on May 8th at Gosforth (R.G.G.). Two Swifts were seen to fall to the ground on one occasion and after a few seconds to take wing with great difficulty (R.C.).

227. NIGHTJAR.—On migration. 'In the afternoon of May 19th, the wind veering to the east, I found a hen Nightjar at Biddick Hall Farm; the bird rose wild from one of the fields and was later flushed from the shelter of some gorse bushes. I am convinced that it was on passage' (H.M.S.B.). During the summer a pair was seen near Allenheads, N., where it probably bred. 'This is the first occasion I have known them so far up the dale' (G.A.).

232. HOOPOE.—From May 8th a bird spent about 14 days on the Brownsman, Farne Islands. It was seen on several occasions by the watchers whose description left no doubt of its identity (T.R.G.). On September 23rd one was seen feeding on a grassy bank of the promenade at Whitley Bay, N. It was judged to be a juvenile, as its crest was rather small, its bill rather shorter than normal and its plumage, apart from the black-and-white wings and white rump, rather dull (W.W.N.).

234. KINGFISHER.—Now very scarce indeed. Near Alnwick where it was usually fairly common, now wiped out; none seen since the frost (J.E.R.). None seen at Alnmouth since the frost (H.T.). None on the Tyne or its tributaries in the Stocksfield area (G.W.T.).

235. GREEN WOODPECKER.—Numbers not seriously reduced. Seen and heard recently on the Banks, Durham City and in Houghall Wood (J.J.H.).

237. **BRITISH GREAT SPOTTED WOODPECKER.**—Somewhat reduced in numbers. In April four adult birds were seen together in Gosforth Park probably two pairs (M.G.R.). One pair nested successfully (W.R.L. and K.N.G.). Not uncommon around Durham City; visits the Banks, but does not breed there (J.L.C.).

249. **LITTLE OWL.**—Range still further extended. Now reported from the Glanton district, N. (N.R.). Near Lamesley in the Team Valley; 'my first record of this species in the district' (G.D.S.). Now breeding at Gosforth Park (J.R.C.).

250. **LONG-EARED OWL.**—A pair was observed in Gosforth Park on several occasions (J.D.T.) and on August 17th a family party was seen (W.R.L. and K.N.G.).

251. **SHORT-EARED OWL.**—July 18th one seen hunting over a young plantation, near Craster, N., probably breeding near by (J.M.C.). Young birds seen on the moors near Middleton-in-Teesdale, where they probably were bred (H.W.).

254. **BARN OWL.**—On February 27th a hen was picked up dead at North Farm Brenkley, near Seaton Burn, N. It had been seen, with its mate, about the stack-yard for three weeks and had evidently perished from cold. It bore a ring proving that it was one of a brood of four nestlings ringed on August 29th, 1945, at Blagdon by Ridley and Ash. None has been seen at Blagdon since the severe weather, but several found dead (M.W.R.). On February 13th one was seen in Gosforth Park Sanctuary (W.A.W.).

259. **PEREGRINE FALCON.**—A pair bred on Cheviot; on May 31st the young were heard calling from the eyrie (F.B.). On August 24th two were seen together in the Bizzle (P. C. Hall). On April 4th a pair was seen on a rocky portion of one of the Simonside burns and on May 11th they evidently had eggs on a grassy ledge (J.D.T.). A pair attempted to breed in Upper Teesdale; but on the Yorkshire side of the Tees. They laid twice, on different sites, four eggs, then two, but both clutches were taken (H.W.).

263. **KESTREL.**—A bird ringed as a nestling at Alwinton, N., on May 27th, 1945, was found dead at Farnham, Surrey on March 22nd, 1947. A bird from the same nest has already been reported as recovered at Fort William, Inverness, in January, 1946 (O.R., 1946) (M.W.R.).

268. **ROUGH-LEGGED BUZZARD.**—On November 16th one was definitely identified in the Usway Valley, Coquetdale, N. Its characteristic white tail was clearly seen (J.D.T.). On December 9th one was clearly identified near the river Aln between Lesbury and Alnwick (C.E.C.). Both these birds are described as being mobbed by Carrion Crows. The bird recorded for so many years as visiting the moors near Waskerley, Weardale, did not appear this year (R.M.).

269. **COMMON BUZZARD.**—A single bird spent over two months in Lambton Park, D. It first appeared towards the end of January and was last seen during the first week in April (J.W.). A single bird spent three weeks in Gosforth Park. It was first noticed on September 28th (M.A.A. and J.G.S.) and was seen by several observers until October 18th (M.G.R.). There were no birds in Upper Teesdale during the breeding season this year (H.W.); but on September 28th one was seen on the moors near Middleton-in-Teesdale (I.R.E.).

272. **MONTAGU'S HARRIER.**—A pair of Montagu's Harriers bred successfully and reared three young on a heather moor in the west of Durham County. No nest was found and the young were well fledged before they were discovered on August 13th. The keeper said that he had seen both adults earlier, but no female was seen after the young were first located. On two occasions two adult cocks were seen together at the site. The birds were kept under observation and were last seen on August 21st (M.G.R. and G.W.T.). This is the first time that this species has been known to breed in County Durham since 1835 (see *B.B.*, Vol. XLI, p. 23).

278. **KITE.**—On May 15th, the day after the Black Kite had been shot (see below), R. Henderson of Holy Island saw a Kite feeding on a dead Guillemot at the bottom of the Heugh. He had a close-up view of it on the ground and in flight and described it thus—'General colouring rufous with a conspicuous dark patch on the white underside of the wing; head and neck whitish striped with black; long forked tail.' Henderson is familiar with the Kite having seen it when serving in the Middle East; he is thus quite sure of the correctness of his identification and is certain that it was not a Black Kite.

279. **BLACK KITE.**—On May 14th a male, in first summer plumage, was shot at West Kyloe, Beal, N. It had been in the neighbourhood for three or four days

and was suspected of taking the farmer's poultry. This is the second record for the Black Kite in Northumberland; the first having been trapped in Alnwick Park on May 11th, 1866. The species has only occurred five times in the British Isles. Both these Northumberland specimens are now in the Hancock Museum (see *B.B.*, Vol. XL, p. 251).

289. HERON.—Owing to wintry weather most of the Heronries were not visited and no counts of nests made. It was reported that the small heronry near Bardon Mill only had two occupied nests; the smallest number recorded for many years (J.P.). No birds were seen at Blagdon where a pair bred last year (M.W.R.). Did not breed successfully at Shipley Moor, N. (H.T.). Many birds were found dead during and after the severe weather and in some districts many fewer birds have been reported. At Styford, Tyne Valley, the heronry trees are being felled (T.F.H.).

297. BITTERN.—On January 1st a badly injured bird was picked up at Billingham Bottoms, Teesmouth, D. (O.C.H.). On January 13th a female was shot at Derwenthaugh, D. Its stomach contained four frogs, various water-beetles, including *Dytiscus*, and portions of sedge (S.E.C.). On February 13th one was seen in a snow-covered hen-run in Alnwick, N., by Mrs. Tilmouth (per H.T.). On August 17th, on the Coquet near Weldon Bridge, N., one was flushed from the reeds on the river bank. It was clearly identified as an adult in fine plumage (E.R.).

300. WHOOPER SWAN.—As already recorded (*O.R.*, 1946) Whoopers were numerous during the winter of 1946-47. In the severe weather of February-March the flocks left the frozen inland loughs and scattered; many of them going to the coast where several perished. A dead bird was picked up as far south as Roker beach near Sunderland in March (F.G.G.). Others visited rivers and unusual places. Half a dozen spent six weeks on the river Allen near Whitfield, N. (M.W.R.). On February 12th two were seen on the Wear at Claxheugh close to Sunderland (J.R.C.). Some remained late into the spring: six frequented Holy Island lough from April 11th to 13th and the last seen on Holy Island sands was on May 18th (F.B.). A single bird was seen on Acomb Flats, near Hexham from May 8th to 13th (R.G. and E.M.L.).

The first reported in the autumn were on October 17th; three on the North Wark Water near Coldstream (A.M.P.). The largest flock reported was of 31 birds (16 adult and 15 juveniles) on Greenlee Lough, N., on November 9th, 10th and 16th. So large a flock was not seen subsequently and again a tendency to scatter was noted; small groups, often family parties, were reported from unusual places. December 29th, eight on flooded fields near Holywell Village, N. (F.G.G.). December 4th, four on Lees Water, Coldstream (A.M.P.). On November 3rd, four on Trewhitt Lake, Coquetdale, N. (T.G.W.). Between November 10th and 23rd two haunted the coast from South Shields to Marsden, D. (F.G.G. and J.R.C.).

301. BEWICK'S SWAN.—As already recorded (*O.R.*, 1946) few were seen in the autumn of 1946. After the turn of the year, however, a few were reported. January 5th, six at Hallington (H.R.O.). January 5th, six (three adults and three juveniles) on Bolam Lough (J.D.T.). January 9th, four on Broomlee Lough (J.A.M.). January 13th to 16th one at Alnmouth (H.T.) but none was seen after the severe weather had set in in February.

In the autumn the only report was of a single bird present on Darlington South Park Lake on November 20th and 21st—'very wary and keeping to the centre of the lake' (A.B.). Lack of reports may be due to the difficulty that observers now find in reaching distant inland waters owing to the petrol ban.

303/307. GREY GESE.—During the autumn and winter observers in many parts of both counties frequently reported skeins of 'Grey Geese' flying overhead. Some of these numbered up to 100 and 150 birds. This may be due to larger numbers being present and/or to the birds being more frequently disturbed by shooters.

307. PINK-FOOTED GOOSE.—November 3rd to 5th a flock of 80 remained for three days in the neighbourhood of Whitburn, D., just as a flock did two years ago (J.R.C.).

311. BARNACLE GOOSE.—In January one was seen feeding with a flock of about 200 Pink-footed on a seed-field north of Lowick, N. (W. de L.A.). On April 12th a flock of 11 was seen flying south off Holy Island (F.B.).

On September 25th, 30 were reported from Goswick (per F.B.) and on October 3rd a flock of 13 was seen flying north-west at Alnmouth (H.T.).



312/313. BRENT GOOSE.—On January 11th there was a flock of from 350 to 400 on Fenham Flats. By mid-February this had increased to at least 5,000, but by April 3rd there were only about 100 left (F.B.).

313. PALE-BREASTED BRENT GOOSE.—On January 16th I examined, in the flesh, a bird which had been shot on Fenham Flats; it was certainly of this sub-species. On the 30th I examined another which was also of this sub-species; this was one of 20 shot out of a large flock of Brents on the 28th; I was informed that 10 of the 20 were pale-breasted (G.W.T.).

315. SHELD-DUCK.—More pairs bred on the Farne Islands than in previous years, perhaps driven to find new breeding places on account of the presence of the military on Ross Links (T.R.G.). Over 100 pairs bred on or near Holy Island—'More than ever before' (R. Henderson per S.E.C.). Several pairs bred about Boulmer; many young ducklings seen in summer months (H.R.O.). Two pairs bred successfully at Amble (A.E.G.). Only a few pairs now breed at Teesmouth. They are most numerous at Teesmouth in the months of February and September. On February 16th, 271 birds were counted, after which date numbers fell steadily until only a few breeding pairs remained. In September numbers were increased, largely by the arrival of immature birds, until on September 24th, 127 were present (J.R.C.).

On April 2nd an adult was present on Gosforth Park Lake (J.D.T.). On October 20th eight on Jarrow Slake (F.G.G.).

317. MALLARD.—Very numerous off the Durham coast this winter. In early December they numbered *c.* 4,000—'the greatest collection of this species I have ever encountered' (J.R.C.). At Gosforth Park on October 16th, *c.* 500 (S. and J.S.A.). At end of December, 850 (J.R.C.). At Jarrow Slake on November, 370 (J.R.C.). At Hallington on November 30th, *c.* 250 (R.G. and E.M.L.).

318. GADWALL.—On August 11th a pair was seen on ponds near Denton Burn, N. (J.A.M.). On October 12th a drake on Hebburn Ponds (C.J.G.). On December 27th a pair at Gosforth Park—'the first of the winter' (J.R.C.).

319. TEAL.—Very plentiful in the autumn and winter. At the end of December there were about 300 on Gosforth Park Lake and about 300 at Teesmouth (J.R.C.).

322. GARGANEY.—A pair bred successfully and reared six young on a pond in north-east Durham where they had previously been suspected of doing so. The brood was first seen on July 20th and later the whole family was twice seen in flight (H.M.S.B.). On April 19th a pair was seen and clearly identified on Gosforth Park Lake (C.J.G., W.R.L. and K.N.G.). From May 5th to 12th a pair remained on Hebburn Ponds, D. (C.J.G.).

323. WIGEON.—Very plentiful in the autumn and winter. As late as June 16th a pair was seen on Holborn, Moss, N. but no evidence of nesting could be found (F.B.).

325. PINTAIL.—Small numbers, usually single pairs, have been reported more frequently than usual from January to April and again from September to December. The largest number was eleven on Gosforth Park Lake on April 1st (S. and J.S.A.). A pair was seen on several occasions on Boldon Flats, D. from April 17th to 30th, but did not remain to breed (C.P. and F.G.G.).

326. SHOVELLER.—A pair bred and successfully reared a brood on a pond in north-east Durham (H.M.S.B.). Up to half a dozen drakes with an occasional duck were seen on Grindon Lough from mid-April to June 20th, but no young were present (R.G. and E.M.L.). A drake remained on Gosforth Park Lake until June 8th (J.A.M.). The largest number counted on Gosforth Park Lake was on September 19th when 43 birds were present (J.R.C.). On September 21st and again on October 10th some of these birds were seen to be diving for food in the centre of the lake. They remained under water for as long as nine seconds and came up with weed in their bills (J.D.T. and J.R.C.).

328. POCHARD.—On the flooded brickfield in Co. Durham where two pairs bred successfully last year (*O.R.*, 1946) only one pair bred; a brood of eight ducklings was seen on July 29th (F.H.S.). One or more drakes were present throughout the summer, one remaining until November 8th. Very few seen on Gosforth Park Lake this autumn and winter compared with previous years (H.R.O. and J.R.C.).

330. TUFTED DUCK.—On the flooded brickfield in Co. Durham, where eight pairs bred last year (*O.R.*, 1946), several were present, but only one brood was seen this year (F.H.S.). A pair bred in the neighbourhood of Hebburn Ponds for the third consecutive year; 10 young were seen (J.R.C. and C.J.G.).



During November and December a small flock spent some time on Leazes Park Lake ; a maximum of 15 was counted (J.W.H. and J.R.C.) and on February 13th three were on the children's paddling pool at Seaburn, Sunderland (J.R.C.).

331. SCAUP.—More plentiful than usual on the coast. From early January to the end of March up to about 20 were on the estuary of the Aln and smaller numbers until May 18th (H.T.). Frequently seen in Amble Harbour in February (A.E.G.). On March 14th a flock of 30 at Claxheugh on the Wear above Sunderland (J.R.C.).

332. GOLDEN-EYE.—On October 24th an immature or female bird was on Darlington South Park Lake, D. (A.B.).

337. EIDER.—Farne Islands : thanks to efficient protection and the closing of the Inner Farne to visitors Eiders had a very successful breeding season. It is estimated that at least 335 pairs bred, and most of them successfully (T.R.G.).

On Coquet Island, Eiders had the best nesting season for years ; the lighthouse keepers reported that they had counted 86 nests. ' During July and August Amble Harbour mouth and the shore from the piers to Hauxley contained more ducklings than I have ever seen before ' (A.E.G.).

339. COMMON SCOTER.—On May 10th off Chiswick, N., three flocks were present totalling c. 800 birds—not more than 100 had been seen there up to that date (F.B.). On June 27th a pair was seen on a flooded brickfield near Durham—an unusual date to find them on inland waters (T.F.H.).

340. VELVET SCOTER.—' During severe weather in February and March they were more in evidence than I have ever before seen them off South Shields ; some were shot by shore-shooters and others were found dead on the beach ' (F.G.G.). On June 13th two drakes were reported off Warkworth—an unusual date (H.T.). More than usual were reported off the coast during the autumn and winter.

342. GOOSANDER.—No nests were reported during the year ; but at the end of June a duck with young was on Temple Pool, Lees, Coldstream ; the ducklings were very small and must have been hatched near this reach of water (A.M.P.). Very plentiful on all the inland loughs both before and after the severe weather—January 12th, 34 on Colt Crag (H.R.O.). March 30th, 25 on Broomlee and Greenlee together (J.A.M.). April 4th, 40 on Broomlee (H.R.O.). Reported several times from Gosforth Park Lake by various observers.

343. RED-BREASTED MERGANSER.—On March 8th five were fishing between the Shields Piers (J.R.C.). From March 28th to 30th a female remained on a pond in N.E. Durham. ' They are not often seen away from the coast in this district ' (H.M.S.B. and F.G.G.). On November 16th a red-headed bird on Gosforth Park Lake (J.A.M.).

344. SMEW.—Several reported from inland waters before and after the severe weather, and from the coast during the frost. The largest number reported was seven or eight on Whittle Dene Reservoirs in mid-January (A.M., T.F.H. and A.J.C.). On January 15th an adult female was shot by accident over the River Blyth at Catraw, N. Its stomach contained five minnows, one eel, one gudgeon, one loach and one lamprey (M.W.R.). The only adult male recorded was on January 5th on Greenlee (I.R.E.).

346. CORMORANT.—A bird ringed on the Farne Islands on July 19th, 1939, was recovered at Nantes (Loire Inf.), France, on February 6th, 1947. (B.B., XL, p. 364).

347. SHAG.—Between 60 and 70 pairs bred on the Farnes (T.R.G.). Two pairs reported to have bred at Dunstanburgh (A.E.G.).

349. GANNET.—On October 25th a very considerable northward movement of this species was observed along the Durham coast off Whitburn. In the space of six hours (11 a.m. to 5 p.m.) no less than 616 birds were counted, made up of the following age groups—adults 442, young of the year 140, immature 34. They passed in an almost non-stop procession in small units, often singles or couples and seldom more than five or six together ; the young usually in company with an adult. During the same period, 377 Kittiwakes passed, also all moving north, chiefly adults, but a fair number of juveniles (J.R.C.).

355. MANX SHEARWATER.—As usual very few records. On September 30th five off Bamburgh (H.T. and C.W.G.P.). October 6th one off Alnmouth, October 18th five off Alnmouth (H.T.). October 3rd one flying south off Holy Island (I.R.E.).

368. **FULMAR**.—Northumberland: At the inland site near Kyloe several birds were present in May, but they did not remain; no eggs were seen, though it was reported that at least one had been taken (F.B.). On Holy Island about 15 pairs were sitting on eggs at the Coves in June (R. Henderson, per S.E.C.). On the Inner Farne, four eggs were laid and three young reared (T.R.G.). At Cullernose on July 10th 48 birds were present (J.R.C.) and on August 17th four well-grown young were seen (H.T.). Reports from other stations were less favourable.

Durham: Fulmars are attempting to spread further south along the Durham coast. Several pairs are well established on the south side of Hawthorne Hive and several in Slippersea Bay (P.L.H.).

370. **GREAT CRESTED GREBE**.—No breeding birds reported in Northumberland. On July 5th a pair was seen on the pond S.E. Durham, where they attempted to breed in 1944 (see *O.R.*, 1944); but no nest or young were seen (J.R.C.). A pair in full breeding plumage was on a flooded field in N.E. Durham from March 28th until April 9th (H.M.S.B. and F.G.G.). One was seen on Hebburn ponds on April 9th, 13th and 16th (F.G.G. and C.J.G.). One on Tunstall Reservoir, Weardale, from August 20th to 27th (R.M.).

371. **RED-NECKED GREBE**.—In January one was seen on the Tweed at Coldstream (A.M.P.). From February 12th to 15th one on the Aln estuary (H.T.). On March 9th one was found dead on Whitburn Bents, D. (F.G.G.). On March 18th one on the Tweed estuary (F.B.). On April 16th one in Beadnell Bay coming into breeding plumage (K.I.). On October 18th one in Beadnell Bay (S. and J.S.A.).

373. **SLAVONIAN GREBE**.—On February 4th a male was found dead by a small lake near Pictree, Chester-le-Street, D. (S.E.C.). On the 20th another was found dead near Greatham Creek, Teesmouth (P.L.H.). March 8th, one found dead at Whitley Bay (J.R.C.). During February as many as four together were on the Aln Estuary (H.T.), and others were reported off the coast.

374. **BLACK-NECKED GREBE**.—A pair bred successfully for the second year in succession on the flooded field in N.E. Durham (see *O.R.*, 1946). A single adult was seen on June 22nd (J.L.C.), June 27th (T.F.H.), and July 1st (J.L.C.). On July 7th two adults were seen for the first time (J.R.C.). Later one small juvenile was observed; but it was not until August 10th that two juveniles were seen, each with an adult in attendance (F.H.S.). The last date on which a juvenile was observed was September 2nd when it was without its parents (J.R.C.). Last bird seen September 30th (J.L.C.). Owing to the amount of cover, it is quite possible to visit this field repeatedly without seeing the birds. On August 31st two adults and two birds of the year were seen on Hebburn Ponds (C.J.G.) and on September 6th, 14th and 18th single juveniles of this species were identified there (J.R.C. and G.W.T.).

375. **LITTLE GREBE**.—On October 11th and 18th a pair was seen on Saltwell Park Lake, Gateshead (G.D.S.).

376. **GREAT NORTHERN DIVER**.—On January 2nd one, with other divers, off St. Mary's Island, N., and on February 24th another (F.G.G.). On March 9th one in South Shields Harbour (F.G.G.). In November one showing much of its summer plumage was in Amble Harbour for about 10 days (A.E.G.).

378. **BLACK-THROATED DIVER**.—Four found dead on the Roker to South Shields beaches after severe weather (F.G.G.). One, Alnmouth Estuary, January 16th and February 15th (H.T. and A.E.G.).

Inland: On April 5th one on Lees Water, Coldstream, where it remained for several days (A.M.P.). On November 3rd one diving on Broomlee Lough (J.D.T.). One on Tunstall Reservoir, Weardale, in the autumn (R.M.).

379. **RED-THROATED DIVER**.—The following figures taken off Warkworth Links give some idea of the seasonal changes in the numbers of this species off the Northumberland coast. January 18th, nine; March 24th, 16; April 12th, 23; 19th, c. 30; May 11th, c. 60; 16th, c. 40; 20th, about 25; September 28th, three or four; October 6th, c. 25 (H.T.). October 10th, c. 50 (A.E.G.).

383. **TURTLE-DOVE**.—More records than usual. In June a pair nested near Cornhill, N., but the eggs were taken (A.M.P.). Several pairs continue to breed in the Kyloe district (A.M.P.). Heard on several occasions in plantations near Swinhoe (F.B.). On July 12th two birds were seen together in the district south of Wooler, where they have not previously been reported (N.R.). At the end of

May one was seen in the garden of Craster South Farm (W.S.C.). On June 28th a pair watched near Healey, N. (T.F.H.). In July one was seen in the Browney Valley near East Buttsfield (F.W.).

386. **BAR-TAILED GODWIT.**—On September 7th there were *c.* 2,000 on Holy Island (F.B.); but thereafter numbers were much lower and decidedly fewer than usual spent the winter on the Northumberland coast. Seldom seen on the Durham coast except for an early flock of 64 at Teesmouth on July 13th (J.R.C.).

387. **BLACK-TAILED GODWIT.**—On April 26th and 27th a flock of 22 and, on the 28th, 18, was seen on Grindon Lough, all in breeding plumage (R.G., E.M.L., G.W.T. and T.F.H.). This is the fourth occasion on which this species has been recorded from Grindon in the last week of April. On April 27th one was seen at Brenkley, near Blagdon, N., where this species has previously been noted two or three times (M.W.R.). On April 27th, and again on May 8th, one in full red plumage on Boldon Flats, D. (F.G.G.). On July 5th one was on Cowpen Marsh, Teesmouth (J.R.C.).

388. **CURLEW.**—In spite of the severe winter, breeding birds appeared in about their usual numbers on the lowland fields; but were scarce on the moors. On April 4th a flock of 30 was seen near Broomlee (H.R.O.).

389. **WHIMBREL.**—On September 21st a large flock, *c.* 100, was observed on a half-cleared turnip field near Wylam, N. So large a gathering is most unusual and rarely seen so far from the sea (G.R.M.).

393. **WOODCOCK.**—During the severe weather many were seen in unusual places and several were picked up dead. Some survived, however, for on April 1st five were flushed from the Gosforth Park woods (S. and J.S.A.). 'Almost completely absent in autumn about Blagdon, N.' (M.W.R.).

[394. **GREAT SNIPE.**—On October 22nd one was seen in flight at Hurworth Burn, D. 'The first to be recorded from this place' (J.R.C.).]

395. **COMMON SNIPE.**—Several reported dead during the severe weather. About Blagdon N. numbers breeding in the spring were about normal; but in the autumn there were very few indeed (M.W.R.).

398. **JACK SNIPE.**—A few, maximum six, were seen on a muddy stream near Stockton-on-Tees between February 23rd and March 16th (P.M.). October 7th, one at Blagdon N., the only record here (M.W.R.). October 9th, one at Cowpen Marsh, D. (J.R.C.). November 7th, one at Whitburn, D. (J.R.C.).

402. **TURNSTONE.**—Fewer than usual reported on the coast in autumn.

404. **SOUTHERN DUNLIN.**—Bred again in small numbers on Durham moorlands; one nest at only 1,350 ft., which is lower than is normal (H.W.). On June 29th a pair seen on Cowpen Marsh, D. in full breeding plumage, but no nest found (P.M.).

405. **NORTHERN DUNLIN.**—The numbers passing through in autumn and remaining to winter on the coast were much smaller than normal. On Jarrow Slake there were few until November, when numbers rose until, by December 15th, there were 71, and on the 30th, 102 (J.R.C.).

406. **CURLEW-SANDPIPER.**—Very few indeed reported, in contrast with last year when they were exceptionally numerous. September 26th, a young bird on the Don near Jarrow (J.R.C.). On October 2nd, one on Holy Island (I.R.E.). On the 4th, one on Jarrow Slake, D. (J.R.C.) and on the 11th, one, a young bird, at Hauxley, N. (J.R.C.).

407. **LITTLE STINT.**—On May 28th one at Longhoughton Steel, N. (H.T.). This was the only bird reported. Last year quite a number was observed on autumn passage, August to October (O.R., 1946) but this year none was recorded.

415. **PURPLE SANDPIPER.**—Very few reported to be wintering on the coast.

416. **SANDERLING.**—A few lingered on Seaton Carew beach, D., until May 17th (O.C.H. and P.L.H.), and about 20 at Boulmer, N., until May 26th (H.R.O.). The first arrivals on the autumn passage were 15 at Alnmouth on July 19th (H.T.). On August 24th a flock of 80 was on Holy Island sands (F.B.) and on September 27th there was a small flock near Teesmouth (O.C.H.). On October 25th a flock of 30-40 was seen at Hartlepool (O.C.H.). As compared with a normal year there were very few birds on the coast this autumn.

417. **RUFF.**—Very few birds seen as compared with a normal year. At Boldon Flats, D., a flock of 13 was present on May 18th, 19th and 20th (F.G.G.) and on August 25th one only (F.G.G.). On September 3rd two were at Whittle Dene N.E. Reservoir, then almost dry (T.F.H.). At Alnmouth on August 26th



one, and September 3rd one (H.T.). On the Don, near Jarrow, D., September 6th two, 7th one, 21st one, all immature (J.R.C.). A few at Teesmouth during September, maximum five birds on the 22nd (J.R.C.).

423. WOOD-SANDPIPER.—Three records: On May 11th, one clearly identified at Holy Island Lough (F.B.). June 7th, one on a flooded field in N.E. Durham (F.G.G.). September 12th, one on the River Don near Jarrow (J.R.C.).

424. GREEN SANDPIPER.—Fewer than usual were reported, all single birds, except that on July 31st three were seen together on a flooded field near Slaley, N. (A.J.C.).

430. ICELAND REDSHANK.—'On July 19th, 1946, I obtained a heavily-marked Redshank from a flock of migrant arrivals at Alnmouth and it proved to be Icelandic in form, with a wing measurement of 168 mm. The skin is now in the Hancock Museum. This is apparently the earliest British record for the return migration of this sub-species (the *Handbook* mentions occasionally first week in August), but I again saw heavily-marked birds in July, 1947, and I think it is highly probable that the second half of this month will be found to be quite normal' (H.T.).

431. SPOTTED REDSHANK.—First reported July 5th at Teesmouth in full breeding plumage. At Alnmouth, one from August 22nd to September 2nd. One on September 10th, 12th and 14th; one September 27th, 29th and October 4th —'at least three different birds I think' (H.T.). On September 12th one on the Don, near Jarrow, and on the 13th one on Jarrow Slake (J.R.C.).

432. GREENSHANK.—First recorded, one on Budle Bay, N., on May 28th (F.B.). Single birds were reported from Alnmouth, Amble and Holy Island, N., during August and September. On September 4th a flock of 15 passed over the estuary of the Tees and flew inland (P.M.). Last seen, two at Hebburn Ponds, D., on September 19th, and one off Amble on October 11th (J.R.C.).

435. RINGED PLOVER.—On June 7th a nest with four eggs was found on a ridge in a newly-sown turnip field on a farm at least three miles from the coast in N.E. Durham (F.G.G.). On September 14th two were seen to fly round Gosforth Park Lake, but they did not settle (J.R.C.).

440. SOUTHERN GOLDEN PLOVER.—Following the severe winter weather, breeding birds were few on most of the moors (R.M., H.W. and others).

441. NORTHERN GOLDEN PLOVER.—On April 22nd about 200 were seen near Whittle Dene Reservoirs, their black gorgettes very striking (W.H.B.). On April 27th at Brenkley, N., about 20—'very definite clear-cut black on head and breast' (M.W.R.).

444. GREY PLOVER.—On August 27th a flock of 24 on Holy Island sands and on September 13th 40 on Fenham Flats—most of them in summer plumage (F.B.). Thereafter, very few reported and only single birds.

449. LAPWING.—Well up to average in Upper Coquetdale (T.G.W.); but breeding birds fewer than ever in the lowlands. Near Bothal, N., none were found breeding in fields where they were common eight years ago (R.C.). On Todburn Steel Farm, near Slaley, N., 240 acres, for the first time not a single pair bred (A.J.C.). Winter flocks were as large as usual. August 16th, at Whittle Dene, between 1,000 and 2,000 (H.R.O.). September 7th, on Holy Island, c. 2,000 (F.B.).

452. OYSTERCATCHER.—About 24 pairs bred on the Farnes (T.R.G.). A pair bred on Coquet Island for the first time for at least seven years (A.E.G.). At least two pairs spent the breeding season on the banks of the Tweed, near Coldstream, but no eggs or young were seen (A.M.P.). On April 2nd three were seen on the banks of the Tyne near Bardon Mill (G.K. and D.N.). A few birds were reported from Grindon Lough on various dates between April 12th and June 19th (W.J.), the greatest number, seven, on May 1st (R.G. and E.M.L.). Near Thropton, Coquetdale, a pair again bred in an open field (T.G.W.).

462. BLACK TERN.—On May 18th three were seen hawking for insects over the rocks on the shore north of Beadnell, N. (H.S.T.).

467. SANDWICH TERN.—It is estimated that there were at least 250 pairs breeding on the Brownsman (T.R.G.). A colony on the Longstone was less successful; between 40 to 50 clutches were counted but few young were reared (T.R.G.). Lighthouse keepers report that a pair bred on Coquet Island in 1945. Five or six birds were seen in a breeding colony of Arctic Terns on the mainland, but no eggs were found (F.B.).



468. **ROSEATE TERN.**—A few were present and probably bred on the Brownsman (T.R.G.). A single bird was identified on the Longstone on June 14th (G.W.T.); but none were detected amongst the Arctics breeding on the Inner Farne (T.R.G.). A few were noted at Alnmouth—May 30th one, July 1st and 4th one, July 9th two (H.T.).

469. **COMMON TERN.**—For at least the third year in succession no Common Terns bred on the Inner Farne, where there was a flourishing colony before the war (T.R.G.). In one small colony on the mainland only two clutches of eggs were found where they are usually more numerous (F.B.). A few pairs attempted to breed at Teesmouth (P.M.); four of them laid eggs (J.R.C.).

470. **ARCTIC TERN.**—On the Inner Farne the colony in the Cove was larger than ever, numbering well over 600 pairs. Arctics were very plentiful on the Brownsman, the largest colony, and some were on the Longstone (T.R.G.). In a mainland colony at least 40 nests were counted in July; but later all but eight were destroyed by a high tide (F.B.). From April 24th to May 7th one frequented Hebburn Ponds (C.J.G.), and at the same time one spent two or three days at another inland pond in N.E. Durham (H.M.S.B.). From April 26th, for three or four days, there were four terns, species not determined, on the River Tyne at Corbridge (T.F.H. and D.B.), one of which remained until May 6th. During this period there were strong westerly winds, occasionally violent.

471. **LITTLE TERN.**—About 25 pairs, the largest number so far recorded, nested on the Northumberland coast in one colony. High tides swept away all the eggs just before they were due to hatch. Later, about eight pairs bred on a safer site (R. Henderson, per S.E.C.). About five nests survived on another site (F.B.). At Teesmouth nine pairs bred in two colonies; eight had young on July 5th (J.R.C.).

477. **LITTLE GULL.**—On February 13th an immature bird was observed off Roker, D., and on the 15th an adult near the same place (J.R.C.). On May 3rd an immature bird was seen at Alnmouth (H.T.). On October 14th an adult was seen at the mouth of Howick Burn (J.R.C.). On six occasions, from November 16th to 23rd, an immature bird was seen in the neighbourhood of South Shields Pier (F.G.G.).

478. **BLACK-HEADED GULL.**—Most of the gulleries were systematically raided for eggs, but at some of them a few young were reared. At the large Holborn Moss Gullery on June 16th many birds were present and numerous chicks were running about (F.B.). At Black-a-burn Lough on May 24th about 500 birds were present, but all the accessible nests had been robbed (G.W.T.). At Little Lough on June 26th about 30 pairs were present and many chicks in down (J.D.T.). At a pond near Redside Wood, Alnwick, on May 25th, about 250 birds were present and on July 12th there were about 45 young (H.T.). Large numbers bred on the island in Hallington Reservoir (E.M.L.). At Grindon Lough on April 12th about 200 birds were present, but it is doubtful whether any young were reared (E.M.L.). The gullery near Edmundbyers was ruthlessly harried all through the season. At one time 60 empty nests were counted. No young were reared (F.W.). At Greencroft Ponds, D., no birds attempted to breed (F.W.). During the severe weather many birds came to window-ledges for food even in the centre of Newcastle.

481. **COMMON GULL.**—On Goswick sands many thousands accumulated to roost in the evenings towards the end of August. By September 23rd, half an hour before sunset, there were *c.* 5,000. The number increased during October and early November, but there appeared to be a great reduction during the frosty spell from November 16th to 19th, so many must have moved away (F.B.). During the severe weather of February-March a few Common Gulls came into Newcastle and took food from the window-ledges of houses and offices.

482. **HERRING-GULL.**—Increased as a breeding species on the Farne Islands where it now outnumbers the Lesser Black-Back. At Marsden, D., 16 pairs bred rearing 26 young (J.R.C.).

484. **SCANDINAVIAN LESSER BLACK-BACKED GULL.**—On March 26th one identified, with Herring Gulls for comparison as to size, on a flooded field near Dinnington, N. (J.A.M.). On October 10th at Gosforth Park two with five of the British sub-species (J.R.C.). On the 26th one with nine British (J.R.C.). On October 26th on Jarrow Slake, five with 48 British (J.R.C.).

486. **GREAT BLACK-BACKED GULL.**—On September 23rd, half an hour before sunset, there were 2,000 in the roosting flock on Goswick sands. Numbers increased

until early November, but during the frost of November 16th to 19th they declined (F.B.). Unusually numerous this winter at Jarrow Slake—December 30th, 680 birds, also many at Teesmouth (J.R.C.).

487. **GLAUCOUS GULL.**—Several immature birds were reported on the coast, one at Amble as late as May 8th (H.T.). Mature birds are rare, but on January 10th one was seen with Herring Gulls on the beach near Old Town, West Hartlepool (R.K.) and on December 14th one on South Shields beach (F.G.G.). During November 26th and 27th, 23 birds were counted flying north off the Durham coast near Sunderland (J.R.C.).

489. **KITTIWAKE.**—Arrived at Marsden Rock breeding station between March 5th and 9th, a month later than in the previous year (O.R., 1946), but the colony was quite as numerous (F.G.G.). Many birds remained on the coast much longer than usual—at Marsden, up to the end of October, six weeks after their usual time of departure (J.R.C.). On November 27th over 470 were counted flying north between Sunderland and Souter Point (J.R.C.).

491. **GREAT SKUA.**—On August 5th one seen on floating drift-wood in the Fairway, Farne Islands (J.M.C.). September 18th, one Blyth Harbour (J.R.C.).

493. **ARCTIC SKUA.**—Off Warkworth and Alnmouth, one on June 28th and up to eight at one time on several occasions from July 11th to August 14th. 'Several of these birds alighted on the sand by the river mouth for considerable periods: the first time I have seen this' (H.T.). I have observed the same habit at Teesmouth (G.W.T.). A few reported off Holy Island, September 20th to 25th (H.R.O.). On October 11th, six off Amble (J.R.C.).

501. **BLACK GUILLEMOT.**—On October 18th and 19th, one seen off Alnmouth (H.T.).

502. **LITTLE AUK.**—A few were picked up dead on the Durham coast during February. On November 26th and 27th, Little Auks were noticed flying north off Whitburn, D., between 9-45 a.m. and 4-30 p.m.; on the 27th, 118 were counted, many singly and never more than six together (J.R.C.).

504. **CORNCRAKE.**—Reports of 27 birds have been received. Most of these were of birds heard calling only and evidence of breeding was scanty. At Mindrum, N., a family party of five was seen at harvest time in mid-September (A.J.C.). At Sparty Lea, 2½ miles north of Allenheads, N., a bird was heard calling in the summer and later, when hay was being cut, a brown bird accompanied by several black chicks was seen, which no doubt were young Corncrakes (G.A.). R.M. writes from the Wolsingham, D., district: 'It is more than 15 years since I heard a Corncrake in this district, but this year a pair nested in a hayfield not far from here; as usual the nest was destroyed by the grass cutter.' From other districts two or three were reported as seen during harvesting, although none had been heard previously in the fields.

505. **SPOTTED CRAKE.**—On October 20th, C.G. and D.B. saw a small Rail on the banks of a small stream flowing into Gosforth Park Lake. It was under close observation in the open for a considerable time. Its small size compared with a Water-Rail, the colour of its bill and feet, its streaked back and spotted head and neck, its barred flanks and fawn-coloured under-tail-coverts, together with its gait and carriage, leave no doubt that it was a Spotted Crake. This is the first to be recorded for Northumberland for many years past and the first time that the species has been mentioned in these Ornithological Reports (1935-47). The only previous record for Gosforth Park was on October 8th, 1898, when a male and female were shot there. These are now in the Hancock Museum.

509. **WATER-RAIL.**—Recorded from Gosforth Park by several observers.

510. **MOORHEN.**—Less plentiful in several districts since the severe weather.

511. **COOT.**—Several observers report considerable reduction in numbers. Very few indeed on the Northumbrian Loughs now (J.A.M.).

513. **BLACK GROUSE.**—Only three reports. April 13th, one near Sweethope, N. (H.R.O.). July 19th, one near Slaley, N. (M.G.R.). November 10th, two cocks near Hallpike Lough, N., 'the only Black-game I have ever seen in that neighbourhood' (J.A.M.). Some years ago they were plentiful round the Northumbrian Loughs and bred there (G.W.T.).

514. **RED GROUSE.**—'Grouse have done fairly well in Allendale despite the heavy loss of stock birds during the winter storms. The heather was excellent this year and Grouse consequently are in very good health once again' (G.A.). This applies equally well to other parts of the two counties.

[519. RED-LEGGED PARTRIDGE.—At Blagdon a clutch of eggs was put under a Common Partridge; eight hatched. In October at least six young were seen (M.W.R.). This is noted here in case any observer records them.]

520. QUAIL.—More reported than for many years past and from a wider area. At Learmouth, N., probably more than one pair bred, as in early autumn the birds numbered from 20 to 24 (D. G. Brown, West Learmouth, per A.M.P.). At Kylene, N., a pair nested and one young bird was killed by a farm machine (H. Hogg, per A.M.P.). On Rock Estate, N., a keeper saw a covey of five birds on October 13th (J.M.C.). Between Craster and Howick one was heard on June 5th in a field of young corn (W.S.C.). Near Boulmer one was heard calling from a hayfield on June 5th, but not subsequently (H.R.O.). Near Forest Hall, N., at the end of June two separate birds were heard calling, one of which was heard again on August 10th (M.G.R. and G.C.V.). At Peasmeadows,  $1\frac{1}{2}$  miles north of Allenheads, N., a Quail was killed by a reaper when sitting on a nest containing nine eggs (G.A.). Other reports come from just across the Border into Berwickshire and from near Great Ayton in Yorkshire, but none from the County of Durham.

Key to the initials occurring in the above Report :—M. F. Adams, G. Aikenhead, W. deL. Aitchison, M. A. Attewell, S. and J. S. Ash, D. Bailey, A. Baldridge, D. Bell (Miss), H. M. S. Blair, F. Brady, W. H. Broome (Rev.), A. J. Clissold, S. E. Cook, R. Cook, J. M. Craster, W. S. Craster, J. R. Crawford, C. E. Crawhall, J. L. Crosby, I. R. English, C. J. Gent, J. G. Gent, T. R. Goddard, K. N. Green, C. Greenwell (Miss), A. E. Gregory, F. G. Grey, R. Grey (Miss), R. G. Grey, P. C. Hall, J. W. Harrison, J. T. Hay, B. P. Hill, O. C. Hill, T. F. Hird, J. J. Hobson, P. L. Hogg, C. Hutchinson, K. Ilderton (Rev.), W. Johnson, G. Kell, R. Kell, E. M. Lobley (Miss), W. R. Lofthouse, A. MacRae, J. A. McGeoch, R. Martinson, P. Mason, E. Miller, G. R. Mountfort, F. J. Nattrass, J. W. Nesbit, W. W. Nicholas, J. B. Nicholson, D. Nixon, W. E. Oliver (Mrs.), H. R. Oliver, C. W. G. Paulson, J. Payne, A. M. Porteous, C. Potter (Mrs.), E. Reid, M. W. Ridley, M. G. Robinson, N. Rollin, W. T. Rutherford, J. E. Ruxton, R. D. Shannon, G. D. Sinclair, J. G. Smith, L. E. Smith, F. H. Stewart, T. W. Stirk (Rev.), E. F. Tate (Mrs.), G. W. Temperley, H. R. Temperley, H. S. Thompson, J. D. Thompson, H. Tully, G. C. Varley, F. Wade, T. G. Wallace, J. Walton, H. Watson, W. A. Wright.

## Y.N.U. BRYOLOGISTS AT BOLTON ABBEY WOODS

H. WALSH

To the members of the Bryology Section who visited the woods above the Strid in late March, the showery weather revealed the mosses to the best advantage. It was real moss weather and the wealth of material that covered the ground, boulders, and tree bases provided deferred pleasure for examination under a drier roof than prevailed at the time of collecting. *Mniums*, *Thuidium tamariscinum* and *Climacium* were a feature of the ground flora near the river. At the Barden end of the wood some fine clumps of Daffodils were noticed without flowers; they had the appearance of an introduction and in Lees' *Flora* mention is made of introduced plants. An extensive patch of *Orthodontium gracile* Schaeg. var. *heterocarpum* Wats., conspicuous in fruit at the base of a tree close to a footpath, recalled to Mr. C. A. Cheetham its puzzling status as a Yorkshire moss. On the Y.N.U. visit to the same area in 1916 the Bryology report mentions the presence of the type but not the variety. Mr. Burrell saw this in 1929, and in connection with this Mr. Cheetham states: 'In choosing the meeting place as the riverside above the Strid one was influenced by this being the locality where Spruce found *Orthodontium gracile* Schaeg. in 1841. I first saw it there in 1907. I often visited the spot until coming to live at Austwick in 1930 and saw it only in the one place, a cleft of the high grit rock. Until recently I have tried to avoid accepting the var. *heterocarpum* Wats. as a newcomer to the country, but this variety is now so plentiful where it was previously absent in Bolton Woods and in many other places I knew very well, that I am bound to accept it as a new moss to these areas.'

The writer's interest in the identification of mosses only dates back to 1945, but after recognising this variety it began to be noticed on moors and in woods

extensively in the Halifax area. There is no question of its enormous output of spores, for every plant seems to produce a capsule and when ripe a slight disturbance gives an emission of spores that reminds one of flicking a ripe Hazel catkin or Yew cone, but it is difficult to accept that even this prodigality of spores is adequate to account for its present range and quantity in the county and its prevalence on our moors and woodlands, for it was only noticed for the first time about 1920 (*The Naturalist*, 1940). There is no mention of any kind of *Orthodontium* in the list of mosses compiled by Mr. C. Crossland for the *Halifax Flora* (1904) and it was not recorded in the Halifax area until it appeared in a list of mosses collected in Crimsworth Dean on the Y.N.U. visit in 1929. At the present time it is one of the most conspicuous mosses of Hardcastle Crag, as it often occurs in quantity at the base of trees near footpaths, and the abundant capsules attract attention. This wood has been well worked both by resident and visiting bryologists; J. Nowell, A. Stansfield, R. Leyland, C. Crossland, H. T. Soppitt and J. Needham were all regular visitors and the latter records a visit, with himself as guide, of Mr. D. A. Jones, Mr. H. C. Broom, and Mr. (now Dr.) W. Watson, who described and named the variety. It is almost incredible that it was present and taken for any other moss; as Mr. Cheetham remarks, the evidence appears to support the view of a recent arrival. Perhaps the best approach to the problem is the careful noting of suitable positions where the moss is at present absent and keeping these under observation. In Hardcastle Crag the moss is capable of growth on the slightest accumulation of peaty material and even on the decaying fronds of ferns, and it appears particularly to be replacing *Tetraphis pellucida* and *Campylopus flexuosus*.

The following list, contributed by Mr. G. A. Shaw and Mr. C. A. Cheetham, may be of assistance to other members of the party. In recording mosses for named areas it often happens that the commoner are omitted. *Mnium hornum* and *Thuidium tamariscinum* are plentiful here, but not on record.

About 135 mosses are recorded for the Bolton Woods area. Although some 50 hepatics are recorded, the small area visited yielded few. The commoner thalloids with *Plagiochila asplenoides* and var. *major* were the most conspicuous. *Scapania gracilis* and *Lophozia Muelleri* occurred occasionally. A star denotes not previously recorded.

- Tetraphis pellucida* Hedw.
- Swartzia montana* Lindb., c. fr.
- Dichodontium pellucidum* Schp.
- D. flavescescens* Lindb.
- Dicranum scoparium* Hedw., c. fr.
- D. majus* Turn.
- D. fuscescens* Turn.
- \**Leucobryum glaucum* Schp.
- Grimmia apocarpa* Hedw. var. *rivularis* W. and M., c. fr.
- \**Barbula fallax* Hedw.
- B. spadicea* Mitt., c. fr. (conf. W. W.).
- \**Weisia viridula* Hedw., c. fr.
- \**W. rupestris* C. M.
- W. curvirostris* C. M.
- Trichostomum tenuirostre* Lindb.
- T. tortuosum* Dixon.
- Cinclidotus fontinaloides* P. Beauv.
- Zygodon Mougeotii* B. and S.
- \**Orthotrichum diaphanum* Schrad.
- Bartramia pomiformis* Hedw., c. fr.
- Orthodontium gracile* Schwaeg., c. fr. (type) (conf. F. Rilston).
- O. gracile* var. *heterocarpum* Wats., c. fr.
- Webera cruda* Schwaeg.
- Bryum pallens* Sw.
- Mnium rostratum* Schrad., c. fr.
- M. undulatum* L.
- \**M. hornum* L., c. fr.
- M. serratum* Schrad.

- \**Neckera crispa* Hedw.
- \**N. complanata* Huebn.
- Homalia trichomanoides* B. and S., c. fr.
- Povotrichum alopecurum* Mitt.
- Anomodon viticulosus* Hook. and Tayl.
- \**Thuidium tamariscinum* B. and S.
- Climacium dendroides* W. and M.
- Brachythecium rivulare* B. and S. (det. J.B.D.).
- B. plumosum* B. and S.
- \**Eurhynchium praelongum* Hobk. var. *Stokesii* Brid. ('Scarcely robust enough but may just pass for the var.' J.B.D.).
- E. myosuroides* Schp.
- E. striatum* B. and S.
- Plagiothecium elegans* Sull. (det. J.B.D.).
- P. deliculatum* B. and S., c. fr.
- P. undulatum* B. and S., c. fr.
- Amblystegium fluviatile* B. and S. (conf. J.B.D.).
- A. filicinum* De Not. (conf. J.B.D.).
- \**Hypnum uncinatum* Hedw., c. fr.
- H. molluscum* Hedw., c. fr.
- H. palustre* Huds. (conf. J.B.D.).
- Hylocomium loreum* B. and S.
- \**H. squarrosum* B. and S.
- H. triquetrum* B. and S.



Mr. Shaw wishes to acknowledge assistance rendered by Messrs. J. B. Duncan, W. Watson and F. Rilston in the determination of doubtful gatherings.

Mr. Cheetham writes: 'The riverside between the grit cliffs and river is a moss paradise, and the assemblage of species is very different to grit valleys in the south-west of the county where hepatics are far more abundant. Here on the grit rocks of the river-bed we see masses of *Cinclidotus fontinaloides* P. Beauv., *Brachythecium plumosum* B. and S., *Grimmia apocarpa* var. *rivularis* W. and M., *Dichodontium pellucidum* Schp. and *D. flavescens* Lindb., both in varied shapes of growth, and a fair amount of *Barbula spadicea* Mitt.

The striking plants on the vertical rocks were *Swartzia montana* Lindb. and *Zygodon Mougeotii* B. and S. Both were plentiful, and on the top of the rocks *Dicranum fuscescens* Turn. as well as *D. majus* Turn. were present, with some small tufts of *Bartramia pomiformis* Hedw., whilst the hepatic-like *Homalia trichomanoides* B. and S. was seen at the base of trees. Some interesting growths of common species were the var. *Stokesii* Brid. of *Eurhynchium praelongum* Hobk., a delicate elongated form of *Eurhynchium myosuroides* Schp., and a type of *Amblystegium filicinum* De Not. difficult to place in the many varieties of this species, and, growing deep in sand, *Trichostomum tenuirostre* Lindb.

Species so common in Ingleton gills, such as the different species of *Thuidium*, were quite scarce, so was *Trichostomum tortuosum* Dixon, and the only tree moss noted was *Orthotrichum diaphanum* Schrad.'

## BOOK REVIEWS

**British Flowering Plants: Evolution and Classification**, by John Hutchinson. Pp. 374, with 174 black and white illustrations and 22 colour plates by the author. Gawthorne, Ltd., Russel Square, London, W.C.1, 25/-.

It is now over 20 years since Dr. Hutchinson published the first volume of his *Families of Flowering Plants* giving his views on the phylogeny and inter-relationships of the families of Angiosperms. The outstanding feature of this work was his conception of two distinct lines of evolution amongst Angiosperms from woody and herbaceous stocks. Since then his convictions as to the validity of this evolutionary dichotomy have deepened and in the present volume he gives a restatement of his views, modified and emended here and there, with special reference to the British flora.

Apart from the dual evolutionary lines within the Dicotyledons the premises on which Dr. Hutchinson bases his system are threefold. He is firstly a firm adherent to the Ranaian hypothesis of the primitive flower, a viewpoint which has surely far more to recommend it than Engler's choice of the Amentiferous families. Secondly, the Monocotyledons are regarded as having been derived from the herbaceous Dicotyledons, with the dichlamydeous, hypogynous and apocarpous Butomaceae and Alismataceae as the most primitive families. Thirdly, the distinction between the two main groups of Dicotyledons, the Archichlamydeae and Metachlamydeae, has been abandoned, the sympetalous families being distributed amongst their 'true relations' in the Archichlamydeae. Here Dr. Hutchinson has broken away from his previous adherence to this traditional distinction.

All three of these basic postulates will perhaps be more readily accepted than his belief in two parallel evolutionary lines within the Dicotyledons, the one, 'Lignosae,' from arboreal, and the other, 'Herbaceae,' from herbaceous ancestors. He is at pains to emphasise that this distinction based on habit is relative and not absolute; that the one line is fundamentally and predominantly but not exclusively woody and the other fundamentally and predominantly but not exclusively herbaceous. There are numerous examples amongst British plants of families, e.g. Papilionaceae, Violaceae, Polygalaceae and Hypericaceae wholly or largely consisting of herbs which are grouped in his Lignosae because comparative morphology shows that foreign fruticose and arboreal species belonging to the same family are the more primitive. A few families, e.g. Pyrolaceae and Monotropaceae, are wholly herbaceous but are classified with the Lignosae on account of their clear relationship with woody families.

In the group Herbaceae also woody species occur in several families as, for example, in the Berberidaceae. (Of this family Dr. Hutchinson says 'we should

remember that only two genera are at all woody, 'yet according to Willis' *Dictionary of Flowering Plants and Ferns*, 190 out of the 200 species in the Berberidaceae belong to these two genera !). But the fact that there are so many exceptions to the woody and herbaceous habits along both Dr. Hutchinson's two main evolutionary lines with its consequent acceptance of the fact that a change from one type of habit to the other has occurred independently and many times over in the course of evolution, surely weakens his position in selecting these very characters as the most fundamentally important in the phylogeny of the flowering plants. It necessitates the assumption that similarities of floral structure in the two groups are due to convergent evolution and leads to the wide separation of families previously closely associated. The Araliaceae and Umbelliferae and the Grossulariaceae and Saxifragaceae are, for example, in each case separated completely, the one being regarded as derived ultimately from a Magnolialian progenitor and the other from a Ranalian type and their floral similarities as being fortuitous. Although we have had 20 years in which to get accustomed to the author's diphyletic scheme many taxonomists who are as Dr. Hutchinson puts it, 'troubled by traditions,' will still find difficulty in accepting some of these segregations as instances of convergent evolution.

The book opens with a short discussion of the chief features of the author's system of classification considered in relation to those of Bentham and Hooker, and Engler and Prantl. This is followed by an examination of the morphological principles and characters accepted as of phylogenetic significance and then by a tabulated sequence showing the evolutionary relationships of the families, including those which form important connecting links in the phylogenetic tree, but which are not represented in the British flora. A brief review of the system as represented by the British families then clears the way for the main part of the book. This consists of a short account of each family, concluded by a scheme showing its probable line of descent and keys to the genera. Floral morphology and relationships with other families form the main theme of the treatment, a useful feature of which is the inclusion of anatomical data and stomatal characters. The new keys to the genera of each family are very welcome as they include most of the recently segregated genera not recognised as such in the standard books in use in this country, e.g. *Chamaenerion*, *Malus*, *Sorbus*, *Baldella*, *Luronium*. There is also a key to the Umbelliferae based on the presence or absence of bracts to the umbels and partial umbels coupled with leaf characters and petal colour, which will enable the inexperienced botanists who attempts to name a specimen in flower only to progress a considerable way along his difficult road if not always to reach his goal.

Another valuable feature of the book is the special account of the Gramineae contributed by C. E. Hubbard. This family is dealt with at much greater length than any other, indeed, the space allotted to it is half as long again as that given to all the other families of Monocotyledons. The book concludes with an artificial key to the families of British flowering plants adapted from the author's larger key in his *Families of Flowering Plants*, and a chart showing the complete family tree of the orders of flowering plants represented in Britain.

Apart from the positions assigned to the families in the scheme of classification, there are some other changes which strike a new note. Many of Dr. Hutchinson's readers will be surprised to find the genus *Allium* transferred from the Liliaceae to the Amaryllidaceae. He rejects as artificial the importance which has previously been attached to the superior and inferior ovary as characters separating these two families and prefers to regard the umbellate inflorescence as the distinguishing feature of the Amaryllidaceae. This choice of the inflorescence as the main criterion of the family will strike many readers as a surprising choice for in so many families, e.g. the Rosaceae, the inflorescence varies widely from racemose to cymose. The distinction, moreover, between the Vacciniaceae and Ericaceae is maintained, though this is again almost entirely based on inferior and superior ovaries. Another innovation is the removal of *Menyanthes*, along with *Limnanthemum*, from the Gentianaceae into the Menyanthaceae. It differs from all the other genera in having alternate leaves and valvate corolla lobes. Yet the position of *Samolus*, which differs from the other Primulaceae in its alternate leaves and its inferior ovary, remains unchallenged. This family is also regarded as of mixed origins, partly from a stock nearest to Caryophyllaceae and partly from types related to the Saxifragaceae. A polyphyletic origin is also postulated for the Euphorbiaceae.

On page 60 it is stated that 'it seems evident that taking Flowering Plants as a whole, that compound leaves have been derived from and are therefore more recent than simple leaves.' In the Ferns morphologists are agreed that evolution has proceeded in precisely the opposite direction; the simple leaf of such a fern as *Scolopendrium* representing a derivative condition arrived at by consolidation from a pre-existing compound leaf type. As it now seems probable that the Angiosperms have been evolved directly from Pteridosperms are there not also grounds for regarding the same viewpoint as equally applicable to seed plants?

The foregoing comments represent a few thoughts which occur on reading this fascinating book. They are certainly not intended as criticisms, for the subject is so vast and complex that only a life-long study backed by all the resources of a great national herbarium can properly equip either the architect for his task of constructing a phylogenetic tree or the critic for his job of pruning it. The problem of the evolutionary relationships of the families of flowering plants is enormously complicated by the great numbers and range of form of the species involved, by the existence of so many characters showing independent evolutionary progression and by the added complexity of the down-grade trends of reduction and suppression as well as progression and elaboration. And though few systematists are equipped with Dr. Hutchinson's breadth and depth of knowledge of the world's flowering plants or his long preoccupation with the phylogenetic aspects of taxonomy, he would be the first to admit where so much is unknown or obscure that speculation must play a very large part in the working out of relationships.

The book is copiously illustrated by the author's own drawings and paintings. The half-tone colour plates each portray several species which are of necessity shown interlacing with one another. The species are arranged in such a way as to show the affinities of the genera and families illustrated with a short description of the probable relationships of the plants on the page facing the plate. The reproduction of the colours, however, is rather indifferent. Some of the plants also appear somewhat artificial as, for example, the Rose depicted on plate 2, while the *Scleranthus annuus* of plate 12 defied identification until reference was made to the key. Many of the line drawings of the text figures are taken from the author's *Families of Flowering Plants*, others are original, and all are admirably clear and artistically satisfying.

Dr. Hutchinson's book is extremely interesting and stimulating: it is also unique. His approach to the study of British flowering plants is different from that of any previous work. Although his theme is essentially academic, the easy manner of presentation makes it readily understandable to the amateur botanist. It will inevitably be of greatest interest and value to students with some background of taxonomic training, but it is a book which no one seriously interested in British plants can afford to be without.

W. A. S.

**The Shorter British Flora**, by C. T. Prime and R. J. Deacock. Pp. 376, with 232 illustrations by A. Swaffer and A. L. Charlton. Methuen & Co., Ltd., 12/6.

This new Flora, intended to be of value to more than mere beginners, is a work of considerable merit. Although in any 'shorter' British Flora there must be an elimination of some species which, while rare in the British Flora as a whole, are locally common, the authors appear to have made their choice very wisely. The omission of *Impatiens glandulifera* seems unfair to the uninitiated, who will certainly meet with it in time, but this seems to be the only obvious absentee. The beginner, however, must be grateful for the extremely clear line-drawings which help to make the artificial keys unusually easy to follow. This volume is rather large for the pocket, but the extra size is counterbalanced by a welcome freedom from the irritating and occasionally ambiguous contractions sometimes to be found in volumes of smaller size.

The inclusion of interesting autecological notes to the species and introductions to the families is a valuable feature of the book. There is evidence that the authors have read widely and recently before selecting their comments and few users of the Flora will fail to be amused by the notes on *Hyoscyamus niger*, edited by those on *Bartisia odontites*, and warned by those on *Nepeta cataria*.

As an introduction to some 720 species, this is an admirable compilation which deserves to be widely used.

H. G. B.

**Flowering Earth**, by **Donald Culross Peattie**. Pp. 200 with six wood engravings by Paul Landacre. Phoenix House, London, 10/6.

Mr. Peattie is an American whose early love of natural history in general, and botany in particular, led him to study at Harvard and then to seek a career as a professional botanist which he later abandoned in favour of writing. But change of occupation did not mean change of interests and botany has remained the subject of most enduring interest to him and flowers are ever recurring topics in his books. In this book, which he dedicates to his teachers, he describes the pageant of plant evolution from the algal life of the early seas through the conquest of the land by palaeozoic floras to the rise of the flowering plants. He discusses the rhythm of growth and life and the nature of living things ranging over a wide variety of topics from protoplasm to pollination, from chlorophyll to coal, and from Hooker to hormones, introducing personal events in his own career.

Peattie is a romantic whose fervour and sense of wonder have not been dulled by time or training. He examines his flowers under the dissecting microscope and identifies them with manual and monograph but he writes about them with the sensitiveness and feeling of a poet. His theme is scientific and his facts are unassailable but his treatment of them is imaginative and quixotic. If you are matter-of-fact and without a streak of romance, you may condemn this unusual book as too high-flown; but if you share Peattie's boundless enthusiasm, you will enjoy it greatly.

W. A. S.

**Plant Viruses**, by **Kenneth Smith**. Second Edition. Pp. 78, with 8 plates and 3 text figures. Methuen's Monographs on Biological Subjects, 6/-.

It is now over twelve years since the first edition of this book was published, and few subjects in biology have advanced with comparable rapidity during this period. The isolation and crystallisation of viruses, the measurement of virus particle size and study of virus proteins are all recent advances; while the electron microscope by making possible the photography of virus particles has proved a powerful tool in the hands of the research worker. The present account based on a short course of lectures given in the Botany School of Cambridge University has been entirely rewritten. It provides a very useful up-to-date survey of the subject suitable for the needs of students without previous knowledge of this field of work, and a list of references to more important research papers gives a guide to further reading.

**Bird Haunts in Northern Britain**, by **G. K. Yeates**. Pp. 175, with 119 plates. Faber & Faber, 25/-.

For his latest volume Mr. Yeates has taken his camera to Scotland and has once again shown what a magnificent bird photographer he is. The areas he has covered stretch from the Borders to Shetland, and the principal species portrayed are the Short-eared Owl, Dotterel, Red-throated and Black-throated Divers, Arctic and Great Skuas, Whimbrel and Red-necked Phalarope. These birds have been photographed before, but seldom so capably, and the importance of the book lies in the very complete series of studies of several of the species mentioned, those of the Greenshank and Short-eared Owl being outstanding. Perhaps the most exciting plate in the book, possibly on account of its unusual character, is a study of birds in a landscape, a group of nine Whooper Swans standing on the edge of a loch with a background of fir-wood and snow-covered mountain. Mr. Yeates has also wisely included pictures of the habitats of his birds. The two Kodachrome plates are less successful than the others; the prevailing blue tones have yet to be overcome.

The text is of complementary importance and perhaps intended rather for the amateur than the expert ornithologist, and he may have confused some of his less expert readers by using vernacular names for birds, such as 'bonxie' and 'tystie,' without explaining to what species they refer. Even if the text adds little to knowledge, Mr. Yeates is a good observer and accurate reporter, and he is first rate when he gives vivid, straightforward accounts of bird behaviour watched by him. His account of nesting Greenshanks is a model of what a descriptive text accompanying photographs should be. He is less successful when he attempts 'fine



writing,' as when he apostrophises, in the second person, the birds which he describes. In one case he produces a statement that would do no discredit to Mrs. Malaprop: ' (the hooded crow) is an Ichabod against whom every man's hand is turned.' The glory is departed, indeed !

This, however, is ungenerous carping. Mr. Yeates' prose is generally vivid, often amusing, and very readable. The book will increase his already considerable reputation as a fine photographer and writer about birds.

M. F. M. M.

**Bird Life in Cornwall**, by **B. H. Ryves**. Pp. 256 with 16 pages of pen and ink drawings by R. A. Richardson. Collins, 10/6.

This book is the result of the author's personal field-work, and of that of the Cornwall Bird Watching and Preservation Society, which he founded in 1931. He describes it as a forerunner to a future 'Avifauna.'

Part I deals with 'Cornish Bird Haunts and some of their Grander Birds,' with chapters each on the Chough, Raven, Peregrine Falcon, Common Buzzard, and Montagu's Harrier. Part II is a 'Guide to Cornish Birds and their Distribution' and includes intimate notes on their behaviour. Herein, 'Passerine Birds' are followed by 'Owls, Hawks and Gamebirds,' by 'Sea-Birds,' 'Water Fowl,' and by 'Wading Birds.' The arrangement is hardly orthodox; if the Corncrake appears with game-birds why not the Woodcock? But an index enables ready reference to any species. Mr. Richardson's drawings are excellent.

Good readable prose, and interesting information are combined. In protesting against exaggeration of the territorial principle as applied to cliff-breeders the author ignores Darling's theory of the biological benefits of colonial breeding, and argues from the premise of insufficiency of suitable sites, which, however, by no means always applies in such colonies.

Incidents of behaviour from Colonel Ryves' long experience (27 years in Cornwall), and clear descriptions of the status of species in this south-west corner of Britain, will be valuable alike to visitors and to students at home.

In a last paragraph the suggestion is made that familiarity with the Wild Birds Protection Acts, and ability to identify birds in the field, should be an indispensable requirement before the issue of a gun license, like the test a motorist is required to pass before he obtains his first driver's license. We agree.

R. C.

**Birds of a Valley**, by **W. R. Philipson**. Pp. 170, with 3 plates and 7 half-page illustrations. Longmans, Green & Co., 10/6.

In this book the impressions and results are recorded of close observation over a period of time in the dales converging on Brothers Water and leading down to Ullswater. It was most pleasant reading and contains some very interesting information. The descriptive writing is excellent; it is simple yet gives a vivid and true picture of the countryside in which the writer is travelling or which forms the venue of an incident depicted. The sheltered quietude of Low Wood, the moorland freshness of High Street and the high solitude of Angletarn Pikes are all made very realistic.

When rabbits strip the bark off young trees during heavy snow it is the sapwood which is exposed, not the 'white heart-wood.' Another sentence may be called a mis-statement; the writer refers to the Tree Creeper 'as it creeps up and down the trunks.' It is very rare for the species to climb down; it invariably flies. The last chapter, on 'Roosting,' is particularly interesting and forms a good introduction to a subject about which a great deal has yet to be learnt.

The black-and-white illustrations are generally good, though a few are a trifle bizarre and not in tone with the writing.

J. P. U.

**Tour on the Continent, 1765**, by **Thomas Pennant, Esq.** Edited with notes by **G. R. de Beer**. Pp. xii+178, with a frontispiece and eight plates. Ray Society Publication. Bernard Quaritch, Ltd., New Bond Street, London, W.1, 17/6.

The name of Thomas Pennant (1726-1798), country gentleman, traveller, naturalist and antiquary, stands high amongst the naturalists of the eighteenth

century. He was a correspondent of Linnaeus, acquainted with most contemporary men of science at home and abroad, and a patron of natural history. Amongst pre-Darwinian zoologists in Britain he ranks second only to John Ray; his most successful zoological books, *British Zoology* and *History of Quadrupeds* (1781) long remaining standard works.

Pennant was a man of very wide interests and great literary industry. During early and middle life he made a series of journeys in Scotland, Wales and England, during which he kept detailed journals, noting the manners and customs, the industries and buildings, as well as the natural history of the places he visited. His accounts of these journeys were published in a series of volumes. Dr. Lightfoot accompanied him on one of the Scottish tours, and the *Flora Scotica* (1777) was published at Pennant's expense. He also encouraged Gilbert White, whose *Natural History of Selborne* was issued in the form of letters to Thomas Pennant and Daines Barrington.

In 1765 Pennant spent six months on the continent visiting France, Switzerland, Germany, Holland and Belgium, and meeting many notable contemporaries. The manuscript of the *Tour on the Continent*, largely based on daily entries in his journal made during the course of his journey, was added to later with a view to publication, but the work was laid aside for other tasks and eventually found its way into the collection of manuscripts in the National Library of Wales. Dr. G. R. de Beer deserves grateful thanks for his work in editing, and the Ray Society for publishing, this interesting journal.

During his continental tour Pennant was particularly interested in meeting fellow scientists and examining natural history collections and 'cabinets'. These included collections of shells, birds, fishes, reptiles, fossils, minerals and coins. But his interests were so many-sided that natural history is very far from dominating the journal. It is essentially a day-to-day account of the places he visited and the things and people he saw. Historical events, the architecture and trades of the towns and villages, the dresses of the ladies and the wines he drank are all recorded. In Paris he witnessed the execution of two criminals, and at Versailles he peeped through a window to watch Louis XV at supper, making a plan to show the positions of the King, the Queen, the Dauphin and others at table and naïvely indicating his own position 'standing in a tub of cinders' outside the window! He visited the great Comte de Buffon in Paris, and later stayed with him at his chateau in Burgundy. Duhamel du Monceau, Brisson the ornithologist, Daubenton and Fougereux, the anatomists, and Chappé, the astronomer, were others whom he met in Paris. At Bern he met Baron Haller, and at Zurich the two Gesners. He also visited 'that wicked wit' Voltaire, whom he found 'very entertaining' and a 'perfect master of our oaths and our curses'. Pallas and Gronovius, the Dutch naturalists, and Trew of Nuremberg, botanist and physician, were amongst the other celebrities whose acquaintance he made.

Perhaps the most valuable part of the chronicle lies, as Dr. de Beer says, in the personal details given about some of these great men. Pennant did not set out to do more than record faithfully his observations and experiences, and the book adds very little to what is already known about him; for although the journal has remained so long unpublished, a synopsis of the tour was given in the autobiographical account which he wrote a few years before his death. But while filling in the details of this important journey the *Tour of the Continent* also strengthens the verdict of critics as to Pennant's accuracy, his acute observation and his systematic methods in tabulating and recording all he saw and never being dull and uninteresting in the doing of it.

W.A.S.

**Travelling Naturalist**, by Anthony Buxton. Pp. 224 with 34 pages of photographs and drawings. Collins, 10/6.

Hunting, shooting, stalking and fishing were the motives for the travels recorded in this book in which the author relates his experiences in stalking wild sheep in Asia Minor, hunting chamois in the Pyrenees and red deer in the Caucasus Mountains and fishing in the rivers of Scandinavia. But there is in the book as he says a good deal of natural history mixed up with various forms of sport, as, for example, when he describes how to identify the footprints of animals and birds in the snow; and he has clearly derived as much satisfaction in observing and sketching the animals he stalked as in shooting them. Interspersed with his travels abroad are

chapters relating sporting experiences in England and Scotland. Yorkshire readers will be interested in the chapter devoted to their county if censorious of the 'Burdalls' for Burnsall in the plate of the River Wharfe. The last two chapters deal with recent observations on bird life in the author's home county of Norfolk and the effect of the severe winter weather of February to March, 1947, on animals and birds. This is a pleasantly-written book by a sportsman of wide experience who is also a sound naturalist.

**Gall Midges of Economic Importance. Vol. III : Gall Midges of Fruit,** by H. F. Barnes. Pp. 184, with 9 plates. Crosby Lockwood & Son, Ltd., 15/-. The first two volumes of this invaluable and important series were published in 1946 and were reviewed in *The Naturalist* 1946, 173. The third and fourth volumes were promised for autumn, 1946, and the rest (5-8) were due for publication in 1947. It would seem that consistent with present-day trends in the world of printing there has been an 'unavoidable delay' in publishing the present work.

The plan of Volume III is exactly the same as that of its predecessors. A foreword is contributed by Dr. A. M. Massee, of the East Malling Research Station. The author's preface calls attention to two problems of special interest, namely, the 'species problem' and the urgent need for extensive and accurate phenological observations to assist the development of effective control measures. In the 'species problem' the author draws our attention to a phenomenon familiar to taxonomists specializing in many different families of insects wherein occur groups of 'biological' species which differ in no detectable morphological characters but which have different host-plants or habits. Both topics offer unusually good opportunities for research.

The list of 'Fruit crops attacked by Gall Midges' (p. 15-19) includes no less than 46 temperate and tropical fruits. Nearly 170 species of Cecidomyiids associated with these crops are referred to in the text. The scope of the data given under the more important economic species may be gathered from the following synopsis of the Raspberry Stem Gall Midge (*Lasioptera rubi* Heeger) (pp. 46-48): scientific name, English names, synonyms, diagnostic characters (of the gall or deformation), damage, description (of adult), distribution (world), life history, food plants, natural enemies, inquilines, control measures, weed control, closely allied species, material, more important references. A very thorough and comprehensive survey of the available data. Unimportant or little known species naturally do not receive so much space.

The photographic illustrations are good, and the enlarged photographs of whole midges are considerably better than those of which we complained in the earlier volumes.

Fruit growers will find the book a mine of information, though it is primarily for entomologists whose work deals with fruit pests. They will render heartfelt homage to Dr. Barnes for having provided them, between the covers of a slender volume, with a potent distillate prepared from the widely scattered but essential raw materials. The amateur entomologist and the student of galls will find the book of almost as great service. No longer can we set aside the Cecidomyiidae as being unworkable owing to the scarcity and unsatisfactory nature of the few systematic works, for the series to which the present volume belongs provides the means by which a keen naturalist may make a start on the study of a fascinating family of insects offering unlimited opportunity for original work.

W.D.H.

**Insect Pests of Glasshouse Crops**, by Herbert W. Miles and Mary Miles. Second Edition. Pp. 200 with 24 plates and 12 text figures. Crosby Lockwood and Son, Ltd. 15/-.

More than twelve years have elapsed since the publication of the first edition of this useful work. Since then numerous synthetic and efficient insecticides such as DDT and Gammexane have been put on the market. The advent of new materials and methods of control and increased knowledge of the pests themselves have made a revision of the original work necessary to bring it up to date. The descriptions and illustrations of the creatures concerned and the nature of their attacks on the various crops should ensure their correct recognition and so lead to the application of the most effective control measures for which full details are

given. In spite of the title the pests dealt with include not only insects but mites, centipedes and millipedes, eelworms, woodlice and slugs. This is an invaluable reference book both for the commercial grower with a range of glasshouses and the private gardener with greenhouse or conservatory.

**Sea-shore Life of Britain**, by L. R. Brightwell. Pp. 116, with 4 colour plates, 32 plates from photographs and from drawings by the author and 44 text figures. Batsford Ltd., 12/6.

This is a good popular introduction to marine biology, interestingly written and beautifully illustrated. It will give pleasure and instruction to any intelligent visitor to the seaside. Mainly about animals, it describes, from sponges to whales, the species to be met with on the sands, the rocks and rock pools of high and low tide zones, the *Zostera* meadows of sheltered estuaries and the more unusual creatures occasionally found cast up on our shores after storms. The author is an experienced writer on natural history topics and his account of the appearance, habits and life histories of the organisms he describes is free from the sentimentality, sensationalism and anthropomorphism common to many popular books. He is also a skilful artist whose vivid drawings add greatly to the value and artistic appearance of the book. It might be suggested that when a second edition is prepared—and there is no doubt that one will be required—Latin names be added where popular names only are now used. As these are already used where no popular ones exist, it would tend to uniformity without sacrificing popular appeal, and for those with some knowledge of the subject it would often be a greater aid to recognition than the use of such unpopular names as ‘cow-tail weed’ and ‘edible sea-tangle.’

**The Mountains of Snowdonia**, edited by H. R. C. Carr and G. A. Lister. Second edition, revised and enlarged. Pp. xiii+312 with 27 plates, 15 text figures and 6 maps. Crosby Lockwood & Son, Ltd., 15/.

**National Forest Park Guides—Snowdonia**. Pp. 72, with numerous photographic illustrations. H.M. Stationery Office, 2/6.

Visitors to the Snowdon area who are interested in learning something about the natural history as well as the physical features and antiquities of the district, will welcome these two books. *The Mountains of Snowdonia* which was first published in 1925 and has long been out of print, is a most useful, readable and well-illustrated compendium of information with sections devoted to history, science and industry, literature, and sport. The science section has chapters on the geology, ornithology and flora of Snowdonia contributed by Dr. Greenly, the late Professor Orton and the late Professor Sir J. B. Farmer. These are reprints of the articles written for the first edition. A new chapter has been added by W. L. Taylor, the Director General, H.M. Forestry Commission, on afforestation in the area, and the chapter outlining the industrial activities of the district has been rewritten by Dylan Pritchard. There are also in this section chapters devoted to maps and meteorology. Enthusiastic ramblers, rock climbers and mountaineers will find much information bearing on their recreations, and fishermen are provided with some useful notes on the angling potentialities of the principal rivers and lakes.

The guide to the National Forest Park of Snowdonia is the third of a series, those already published being to the Argyll National Forest Park and the historic Forest of Dean. It is well illustrated and contains detachable maps which should prove of considerable value to visitors to the Park. The 21,000 acres of this National Forest Park which was formed in 1936 and which embraces the Gwydyr Forest and smaller Beddgelert Forest affords an outstanding example of how afforestation may go hand in hand with the preservation of scenic amenity. The geology is explained by Dr. Greenly, and Mr. N. Woodhead of University College, Bangor, describes the plant life. There are also accounts of the wild animal and bird life by Mr. W. Aspdon, the butterflies and moths by Mr. F. C. Best and an article on the forests by Mr. R. H. Smith, formerly Acting Conservator of Forests for North Wales. Other contributions include accounts of antiquities, literature, poetry, place-names, walks round Beddgelert and Bettws-y-Coed, the mountains, lakes and rivers and approaches to the Park, and a section giving general information about hotels, youth hostels, camping grounds and bathing, fishing and other facilities.



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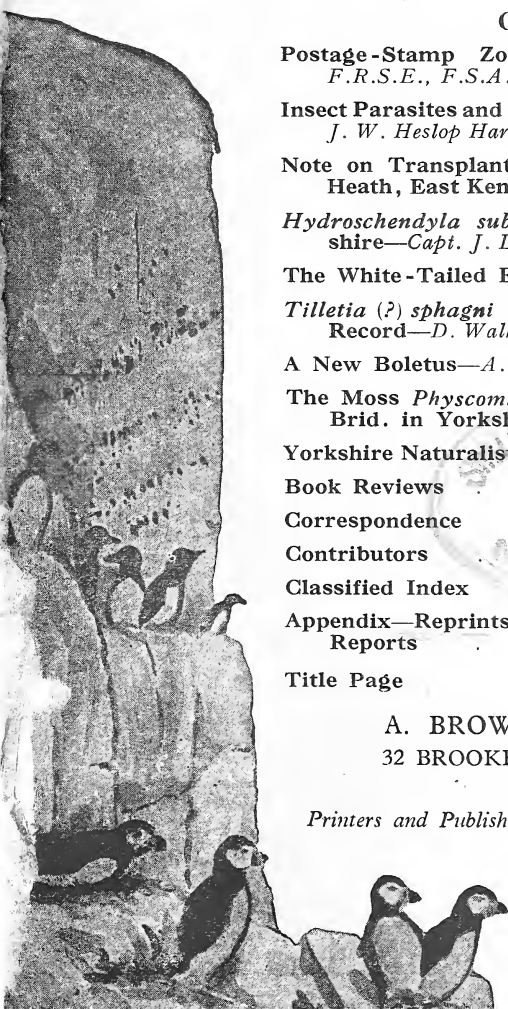
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## POSTAGE-STAMP ZOOLOGY

WARREN R. DAWSON, F.R.S.E., F.S.A.

Presidential Address to the Bletchley and District Philatelic Society, 1948.

IN 1840 the British Government issued the first adhesive postage stamps; these stamps bore the head in profile of Queen Victoria. The portrait was drawn by Henry Corbould from the obverse of the medal, designed by William Wyon (one of the most famous coin and medal engravers of his generation), to celebrate the Queen's visit to the City of London in 1837. This youthful portrait was retained for all issues of British stamps throughout Queen Victoria's long reign, although on the coinage new portraits of the Queen at more advanced ages were adopted from time to time. Most of the Colonies and Protectorates followed the same practice as the Mother Country, the majority of their stamps bearing the early portrait; but some, such as Canada, Newfoundland and Victoria, at various dates substituted later portraits.

The fashion thus set up in the first issue of adhesive stamps in Britain was followed by nearly every country in the world—that is to say, the head of the reigning monarch, president, or other ruler became the recognised type of nearly all postage stamps. A few countries, however, adopted arms, badges or emblematic devices, as, for example, Norway, France, and Germany.

Stamps had been in general use for many years before the old precedents were broken, but when a new departure had once been made it was freely taken up. Stamps appeared with scenic or landscape designs, or with views of historic buildings, monuments, and an unlimited range of other subjects, such stamps necessarily being of larger sizes than those generally in use. Amongst the miscellaneous motifs displayed on stamps, pictures of mammals, birds, and other animals play an important part, and it is proposed in the following paragraphs to make a brief survey of some of the principal zoological subjects depicted on stamps. The list that follows does not profess to be complete, but is rather a selection based principally on the stamps of the British Empire, but with some examples drawn from those of foreign countries.

Most of the zoological subjects are of comparatively recent introduction; a few, however, have been in use since an early period in stamp-postage.

**MAMMALS.**—Taking the mammalian class in its zoological sequence of classification, the highest order is that known as Primates, which comprises man, the apes, monkeys, and lemurs. Of this large order only three species figure upon stamps: the first is the great ape known as the orang utan, a native of Sumatra and Borneo. In the issue of 1895 of North Borneo the 4-cent stamp has a side view of an orang in the attitude of walking, with several smaller ones in the background. The 6-cent stamp of the Jubilee issue of 1931 has a much more detailed representation of the head of the animal. This is repeated in the 10-cent stamp of 1939. The second is the chimpanzee on the 5-cent stamp of Liberia, and the third member of the order is the lemur, of which a small figure occurs in Madagascar stamps of various values of the 1903 issue. The true or typical lemurs are confined to Madagascar and the Comoro Islands, where there are several species.

The next two orders of mammals, the Chiroptera (bats) and Insectivora (moles, hedgehogs, etc.), are not represented at all on postage stamps, and we accordingly pass on to the Carnivora, or beasts of prey. Of this order, the most typical example, the lion, is, as we should expect, often represented on stamps, even those of countries of which the animal is not a native. On British stamps, a couchant lion is placed below the King's head in the first issue of the 1d. stamp of George V, but it was soon afterwards discontinued. A standing lion occupies a prominent place in the design of the special issue to commemorate the British Empire Exhibition of 1924 and 1925, of which only two denominations, 1d. and 1½d., were made. A standing lion in silhouette is placed below the head of George V in the 10-cent stamp of the 1925 issue of the East African group, Kenya, Uganda, and Tanganyika. The New Zealand 1s. stamp of 1915 has the head and forequarters of a lion on either side of the portrait of the King. In the pictorial 1d. stamp of Southern Rhodesia of the 1925 issue, the King's head occupies the right hand side of the field, and its central part is a view of the Victoria Falls, with a lion, elephant and giraffe in the foreground.

In the foregoing examples the lion is a subsidiary element in the design, but there are cases in which it is the principal figure. Such are the standing lion,

with a landscape background, in the half-anna stamp of 1929 of the Indian Native State of Soruth, and the 3d. stamp of the New Zealand Victory issue of 1920. On some stamps lions appear as heraldic 'supporters,' e.g. British East Africa, 1895 and 1897, where they are placed on either side of Queen Victoria's head. The badge of Cyprus, two heraldic lions-passant, is the central design of the 6-piastre stamp of the Jubilee issue of 1928. The  $\frac{3}{4}$ -piastre stamp of the same series has the head of a lion reproduced from an ancient Greek coin.

Next in importance to the lion is the tiger, and this animal appears in the stamp of some of the Straits Settlements. It takes two forms: one is a full-face view of the head of the beast, as that in the stamps of Negri Sembilan, Pahang, Perak, Selangor, and Sungei Ujung. The other type shows the forepart of the animal emerging from the jungle, and occurs in other issues of the stamps of the same States between 1891 and 1895. The whole animal, charging, with a landscape background, is the type for all values of the 1900 issue of the Federated Malay States.

Proceeding with the cat tribe, we come to the leopards, of which two species occur in stamps. The typical leopard, the *Felis pardus* of zoologists, is well represented in the stamps issued for the Seventh Tripoli Exhibition of 1933, and in the 1-franc 75-cent stamp of 1942 of the Belgian Congo. A more conventionalised picture of the leopard is the subject of the 1934 issue of Nyasaland, where the animal is standing on a mount facing the inset portrait of the King. The other species is the clouded leopard (*F. nebulosa*), a handsome animal which inhabits the mountainous regions of India, Burma, and Siam, and of the Malay Peninsula and Indonesia. It is represented crouching on the bough of a tree in the 25-cent stamp in the 1931 issue of North Borneo.

A humbler branch of the cat tribe is the group comprising the civets and mongooses. This branch is represented by the West African palm-civet in the 2-cent stamp of the 1918 issue of Liberia. Many species of civets occur in various countries.

We now reach the dog tribe, the only member of which to be found in stamps is the Newfoundland dog in the 14-cent stamp of 1932 of Newfoundland (in which it is the sole figure) and the large stamp of the same value in the 1937 issue (where it stands beside the portrait of the King). This dog is also shown in the 10-cent stamp of 1932 of the French islands of the Saint-Pierre group.

The bear tribe is represented by two species: the polar bear in the Greenland 30-ore stamp of 1938, and the small black bruang, or Malayan honey-bear, in the 10-cent stamp of the 1895 issue of North Borneo.

Of the aquatic members of the Carnivora, that is to say the Pinnipedia, or seals, it may be noted that the sea lion occurs in the arms of the Falkland Islands, as shown in the 10s. stamp of the centenary series of 1933. A seal, recumbent on an ice-floe, is shown in the 5-cent stamp of 1880 of Newfoundland; another kind of seal is the subject of the 15-cent stamp of the 1932 issue of the same country, repeated, together with the King's head, on the larger stamp of 1937. A group of seals, on a smaller scale, is shown in the 15-cent stamp of the 1897 issue.

The great order of Rodentia, or gnawing animals, has but a single representative in stamp design, namely, the beaver. This animal occurs as the central subject of an early issue (1851) of the 3d. stamp of the Colony of Canada. It has not been repeated in any issue of the stamps of the Dominion of Canada.

We now come to the order Ungulata, the hoofed animals, both ruminating and non-ruminating. The pig tribe is exemplified by the wild boar in the 10-cent stamp of 1909 of the State of North Borneo. Related to the pig tribe is the massive hippopotamus of the African rivers; it is shown in the 1-dollar stamp of Liberia (1892) and in the 10-lira stamp of Italian Somaliland (1932).

The camel in its trappings with a rider carrying a flag (the standard of the Dulaiam Camel Corps) is the device on the stamps of 4 and 8 annas and 5 rupees of the 1923 issue of pictorial stamps of Iraq. In the stamps of the Sudan a camel in rapid motion carrying an Arab rider is the subject of all the issues from 1898 onwards. The Sudan air mail stamps of 1931 have the statue of General Gordon mounted on a camel with the desert as a background, and with an aeroplane and palm trees as adjuncts. Other figures of the camel may be found in the stamps of various values of Eritrea (1933), of the French Somali Coast (1909), and of Mauritania (1938).

In the New World the camel is replaced by the llama, which occurs in various issues of Peru from 1862 onwards and in the 2-cent 1932 stamp of Bolivia.

Deer of two species are met with in stamps. The reindeer or caribou is shown in the 5-cent stamp of the 1932 issue of Newfoundland. The same figure of the animal combined with the head of the King occurs in the large 7-cent stamp of 1937, and the head only of the animal in the stamps of all values of the 1919 issue of Newfoundland. The reindeer is also the subject of the 15-ore stamp of Norway (1939). The other species is the Rusa, Sambar, or Malay deer, which is found in the 2-cent stamp of 1894 of North Borneo, and the same head with a different border in the stamp of the same value of the 1895 issue.

Akin to the deer is the giraffe, and this handsome animal occurs, together with the elephant and lion, in the Southern Rhodesian stamp already mentioned in connection with the latter animal. The head only of the giraffe is the central device of stamps of various values in the 1922 issue of Tanganyika. The best large-scale pictures of the giraffe (of which there are seven or eight local races) are to be found in the stamps of the Nyassa Company which administered the Portuguese Territory there until 1929. The giraffe thus occurs in many denominations issued between 1901 and 1925.

Various races of oxen are represented in stamps. A group of African buffalo is seen in the landscape-piece below the head of George V in the Bechuanaland stamps of 1932 and 1938; a pair of Malay oxen drawing a plough is the subject of the Kedah (Federated Malay States) stamp of 1912; a similar group facing in the opposite direction is portrayed in the 8-cent stamp of North Borneo; a herd of Fulani cattle in a landscape surmounted by the King's head is the design of the 1s. stamp of 1936 of Nigeria. There are many other examples of the native cattle of various races and of various countries, but we must pass these by, only mentioning the Zebu ox in the stamps of Madagascar of 1903 and 1930.

Of the sheep tribe, a fine horned merino sheep is the subject of the MacArthur Centenary stamps (1934) of Australia, and a Romney Marsh ram occupies the centre of the  $\frac{1}{2}$ d. stamp of 1933 of the Falkland Islands. A flock of sheep, with a larger sheep's head as an inset, is the device of the 2 $\frac{1}{2}$ d. stamp issued in New Zealand on the occasion of the Congress of Empire Chambers of Commerce in 1936, and a flock of sheep is also the subject of the Falkland Islands 2 $\frac{1}{2}$ d. stamp of 1938. The black-headed sheep occurs in the half-anna Somaliland stamps of 1938 and 1942.

Akin to the oxen and sheep are the various species of antelopes. The head of the springbok antelope is the subject of the  $\frac{1}{2}$ d. stamp of the Union of South Africa issued in 1926. A small figure of the same animal occurs below the King's head in the Orange River Colony stamps of 1903. The eland, one of the largest and most beautiful of the African antelopes, is shown in the 1s. 3d. stamp of South West Africa of 1931; the head of the bongo antelope is admirably depicted in the 1-cent stamp of Liberia, 1918, and the gnu (called by the Boers *wildebeeste*), occurs together with zebras in the 2s. 6d. stamp of South West Africa of 1931. The gnu is also shown in association with the springbok in the stamps of the Orange River Colony already mentioned. Among the smaller antelopes, the head of the kudu occurs in the Somaliland stamps of 1938 and 1942, and that of Grant's gazelle, a handsome example with lyrate horns, in stamps of various values in the 1938 issue of Italian East Africa.

As to the horse tribe, the horse itself enters as an accessory into the designs of many stamps, but never as the principal subject, so we may pass it by. The zebra, in addition to its occurrence with the gnu just mentioned, is the central subject of the Nyassa Company's 30-cent stamp of 1921. This is the species called by the Boers *bonte-quagga*, and known to us as Burchell's zebra, of which there are several local races. Its English name was given in honour of the explorer, William John Burchell, who travelled extensively in Africa in 1811-15.

We come now to the thick-skinned members of the hoofed order. The Malayan tapir is shown in the 1-cent stamp of 1909 of North Borneo, and the rhinoceros is the subject of the 6-cent stamp of the same series. Of the two species of elephants—the African and the Indian or Asiatic—we have many examples. The former is found, together with the lion and giraffe, in the Southern Rhodesia stamp already mentioned. A small figure of the elephant is in a medallion below the King's head in the large stamps of Sierra Leone of 1915, and a larger and very fine picture of the animal is in the 5s. stamp of the same issue. African elephants are subsidiary figures in the 1922 issue of Gambia and the principal subjects in



the issue of 1938. There are good examples also in the stamps of Italian Somaliland of 1903 and of Liberia of 1906.

The Asiatic elephant is well shown in a group of these animals which form the pictorial subject of the 50-cent stamp of the 1935 issue of Ceylon, and there is a splendid figure of a single elephant with upraised trunk in the 5-cent 1909 stamp of North Borneo. A group of four elephants, three of them with riders, appears in the higher value stamps of the 1895 issue of Perak and in the 1900 issue of the Federated Malay States. In the 1938 issue of Burma an elephant moving teak logs is depicted on the 3-anna stamp, and the animal also figures in the 3-anna 6-p stamp of the 1946 Victory issue.

Of the order Cetacea (whales and dolphins), only two examples are known to me. The 6*d.* stamp of the Centenary issue (1933) of the Falkland Islands represents a whale, which seems to be a rorqual, and a smaller cetacean, the Caribbean dolphin, is the subject of the  $\frac{1}{2}$ *d.* stamp in the Cayman Islands issue of 1937.

One of the lower orders of mammals, known as the Edentata, which comprises the sloths, ant-eaters and pangolins, is represented in stamps by one species only, the great ant-eater or ant-bear, which inhabits the tropical parts of South and Central America. This strange animal, with its long cylindrical muzzle and bushy tail, is well shown in the 1-cent stamp of 1904 of French Guiana.

To complete the series of mammals we have finally to mention the typically Australian animals which belong to the two lowest orders of the class—the Marsupialia, or pouched mammals, and the Monotremata, or egg-laying mammals. Postage stamps give us examples of two animals—the kangaroo and the koala—belonging to the first of these two orders, and of one—the duck-billed platypus—belonging to the second.

The kangaroo occurs as the central figure in the 1*s.* stamp of 1889 of New South Wales and as a subsidiary figure in the 2 $\frac{1}{2}$ *d.* South Australia stamp of 1894. The kangaroo and the emu are placed, like heraldic supporters, on either side of the King's head in the Australian stamps of 1913 to 1921, and another type has a kangaroo with an outline of Australia as a background; it is also the subject of the  $\frac{1}{2}$ *d.* stamp of the 1937-38 issue. The koala, having a superficial resemblance to a small bear (as is especially emphasised by the absence of a tail, the broad furry ears, short wide head and stumpy limbs), is often spoken of by the Australian settlers as the 'native bear.' It is an inoffensive little animal and is easy to tame. It is shown on the 8*d.* stamp of the Australia issue of 1937-38.

The duck-billed platypus, although a true mammal in that it suckles its young, has nevertheless the bird-like characters of a horny bill resembling that of a duck, and also of laying eggs from which the young afterwards emerge. When specimens of these animals were first brought to Europe they were thought to be taxidermists' fakes, and it was believed that the bill of a duck had been affixed to some beaver-like animal. The observation of living animals, however, set all suspicions at rest, and in recent years a platypus has actually bred in captivity and photographs of the eggs and young have been published in English newspapers. This strange animal is depicted in the stamps of Tasmania of 1880, and it is the subject of the 9*d.* stamp in the Australia issue of 1937-38.

With the platypus we close the series of mammals and pass on to the next great class—the birds.

**BIRDS.**—Many species of birds are depicted on stamps, and it will be convenient to deal with these in geographical rather than zoological order. Taking Oceania first, we find that several of the rare and beautiful birds of New Zealand have been appropriately used by the stamp designers. The apteryx or kiwi, a flightless bird peculiar to New Zealand, is several times shown in the stamps of that country. The 6*d.* stamps of 1898 and 1907 are similar and depict the kiwi, and in a different attitude it is shown on the 1*d.* stamp of 1935.

Two remarkable species of parrot, called respectively kaka and kea by the Maories and *Nestor meridionalis* and *N. notabilis* by naturalists, are again peculiar to the New Zealand region. The kaka is about the size of a crow, but the kea, which was discovered in 1856, is somewhat larger. Both these birds are represented together in the 1*s.* stamps of the 1898 and 1908 issues. Another New Zealand bird, the huia, is the subject of the 3*d.* stamps of the same two series. The male huia has a long, slender, curved beak, and the female a much shorter and straight beak. The plumage is black with a greenish metallic lustre, and the birds feed upon a timber-boring grub.



The wrybill has the peculiar feature of an angular bend sideways in its long beak between the base and the tip; the point of the beak, instead of being directed forward in the same axis as the body, flexes sharply to the right towards the end. In the stamps of the Cook Islands of 1898 this bird is shown in flight. Yet another New Zealand bird to be noticed is the pied fantail. The latter term in England refers to a variety of pigeon, but the New Zealand fantail belongs to the family of the flycatchers. It expands its tail into a regular fan by a sidelong flirting movement, and its portrait in this attitude adorns the  $\frac{1}{2}$ d. stamp of the 1935 issue of New Zealand. The 1s. stamp in the same series depicts another remarkable bird, the tui, or parson-bird. It was so named from the two tufts of white feathers hanging beneath the chin which were thought to resemble the linen bands worn by clergymen before the modern clerical collar came into general use.

We may now pass over to the island continent of Australia, on the stamps of which several native birds are depicted. One of the most striking is the lyre-bird, which was first discovered in 1798 in New South Wales. It derives its name from the lyre-shaped form assumed by the main tail-feathers when erected. It is well shown in the 1s. stamp of Australia of 1937, also on a larger scale in the issue of 1932, as well as in the 8d. stamp of New South Wales of 1888. The Australian kingfisher, usually called the laughing jackass from its peculiar cry, is another striking bird. It may be seen in the 6d. stamp of 1914, and again, in a better view, in the issues of 1932 and 1937-38. The emu, an ostrich-like bird, is shown by itself in the New South Wales 2d. stamp of 1888, and in company with the kangaroo flanking the King's head in the Australian stamps of 1914. A good figure of the emu is also to be found in the 5 $\frac{1}{2}$ d. stamp of Australia of 1940. On the colonisation of New South Wales in 1788 the emu was common in the eastern portion of Australia, but it has been so much persecuted that its range to-day is very restricted.

The large islands between Australia and the mainland of Asia are inhabited by many remarkable birds. The argus pheasant, for instance, is one of the most beautiful birds of Borneo, the Malay Peninsula and Siam. It is shown with its peacock-like tail fully extended in two issues (1894, 1897) of the 5-cent stamp of North Borneo. The bird of paradise, first discovered by Magellan's expedition in 1521, is another of the most striking birds of this or any other region. It is depicted perching with its long tail sweeping the ground in the stamps of New Guinea issued in 1931, and in the large 2d. stamp of Papua (1932) the bird is shown in flight. The megapode, a large gallinaceous bird usually called the brush-turkey, but really a species of hornbill, and a crested cockatoo form the subjects of the 24-, 16- and 12-cent stamps respectively of the fine series of North Borneo issued between 1909 and 1922.

Of African birds, mention may be made of the gom-paauw (gum-peafowl) of South Africa. It is a species of bustard, called by naturalists *Otis cristata*, and it feeds largely on the gum of the mimosa bushes of the plains. It is well shown on the  $\frac{1}{2}$ d. stamp of 1931 of South West Africa. The crowned crane, or kavrondo, is represented by a pair arranged as heraldic supporters of the King's head on the 1-cent stamp of 1935 of Kenya, Uganda and Tanganyika.

Some birds of various widely-scattered regions remain to be noticed, and we will now disregard geographical order. A penguin is the central figure in the 5s. stamp of 1933 of the Falkland Islands. The booby, a sea-bird akin to the gannet, is shown in the 1d. stamp of the Cayman Islands, 1935. Other sea-birds to be mentioned are the cormorant in the Peruvian stamps of 1936, and the frigate-bird (so named by sailors on account of the swiftness of its flight), shown in the 1939 stamps of the Gilbert and Ellice Islands. Allusion may also be made to the long-tailed tropic bird, so named by the early navigators. The two middle tail-feathers project far beyond the rest. Tropic-birds fly very far from land and often hover round the masts of ships. This bird is shown on the Bermuda 7 $\frac{1}{2}$ d. stamp of 1938.

Flamingoes in flight are shown in the oblong 8d. stamp of the Coronation issue of the Bahama Islands and geese in flight in the 7-cent Canadian air mail stamp of the 'Peace and Industry' issue of 1946. The new 1s. 3d. stamp of the Falkland Islands shows vultures in flight.

Amongst the remaining birds of various kinds we have the homely crow in the air mail stamps of Holland of 1938, the Icelandic falcon in the triangular air mail stamps of Iceland of 1930, and the beautiful quezal in various issues of the stamps of Guatemala from 1879 onwards. This last-named bird inhabits the forests

of Guatemala in Central America; it is about as large as a turtle-dove, but it has a long flowing tail of a rich green colour five or six times the length of the body. Mention must also be made of the *teru-teru*, a plover-like bird shown on the stamps of Uruguay of 1923, and of the *kagu*, a very curious bird found after the French occupation of New Caledonia in 1852. This bird, about as large as the domestic fowl, has a bright red bill and legs, large eyes, a prominent crest, and strikingly-coloured plumage. It is shown, very much conventionalised, in the Free French issue of New Caledonia of 1942.

The last bird to be mentioned is the swan. It has, ever since the beginning of postage stamps, been the device of those of Western Australia. The first swan stamps date from 1854, and there have been many subsequent issues. The swan was also used for the 1½d. stamp issued in 1929 on the occasion of the centenary of Western Australia.

Another species of swan is the subject of the 1d. stamp in the 1938 issue of the Falkland Islands. This is the black-necked swan (*Cygnus nigricollis*), which was first observed in 1670 in the Straits of Magellan and was subsequently found on the Falkland Islands during the French settlement there in 1764. It is a handsome bird of large size, with a bright red knob on its beak, a black neck, and the rest of its plumage pure white. It has been introduced into Europe and may be seen in many English parks, where it breeds freely.

We have now completed our survey of the birds and pass on to the cold-blooded animals—reptiles and fishes.

**REPTILES.**—Reptiles are infrequent in stamp designs. A puff-adder occupies one of the triangular stamps of Liberia of 1921, and a cobra occurs in the 1935 issue of Mozambique.

The crocodile is the subject of the 12-cent stamp of North Borneo of 1894, and a basking crocodile with a landscape background is shown beneath the King's head in the stamps of all values of the 1938 issue of Basutoland. The crocodile also occurs in the triangular 50-cent stamp of the Mozambique Company, 1937. A lizard, one of the many species of the genus *Agama*, occurs on the 15-cent Liberia stamp.

The 8d. stamp of New Zealand of 1935 depicts the tuatera lizard. This interesting animal deserves special mention because it may be called a 'living fossil,' that is to say, it is the sole survivor of a distinctive order of reptiles which became extinct countless ages ago and are found as fossils in the Triassic rocks of various parts of the world. The tuatera, although externally somewhat like a lizard, differs wholly from all true lizards in the nature of its skin and the structure of its skull and skeleton. It was first made known to science about 1830 when it was described and given the name of *Sphenodon punctatum*. It is now very rare as it was greatly reduced in numbers by the pigs which the early navigators and settlers turned loose in the islands.

In the 1934 stamps of Ascension Island, beneath the head of the King, a large tortoise is represented with the outline of the island as a background. A giant tortoise is also shown in the 3-cent stamp of the Coronation issue of the Seychelles Islands. The giant tortoises, once common in many of the islands of the Indian Ocean, are now almost extinct. They live to a prodigious age, certainly more than a century, and possibly two or three. The late Lord Rothschild had several living specimens at large in his park at Tring.

To conclude the reptiles, mention may be made of the group of hawksbill turtles basking on the shore as shown in the pictorial 5s. stamp of the Cayman Islands of 1935.

**FISHES.**—Four species only belonging to this great class have been adopted as stamp designs. A leaping salmon is shown in the large 10-cent Newfoundland stamp of 1937, and the 1-cent stamp in the same series depicts the cod. A swordfish, somewhat conventionalised, is the subject of the 5d. stamp of the 1935 issue of New Zealand. The carp occurs on 5-cent stamp of 1894 of China, as well as in some later issues.

All the above-mentioned animals are vertebrates, that is to say, with a vertebral column or backbone. Invertebrates (which comprise all the animal kingdom lower in the scale than the fishes) do not, so far as I know, occur on stamps at all, with the single exception of the silk-worm, which is the subject of the stamps issued to commemorate the Silk Congress of Lebanon in 1930. These stamps show the insect in its various life-phases: the lava, the cocoon and the moth.

The absence of invertebrates from stamp designs is hardly to be wondered at, for insects, molluscs, worms and other lower types of animal life do not constitute spectacular subjects.

All these zoological stamps, apart from their importance to collectors and their artistic merits, are of high educational value, for each one has a story to tell. The production in nearly all cases is excellent and no criticism is possible on the grounds of accuracy and fidelity to nature so far as the forms of the animals are concerned, but not as regards their colour, for this is purely artificial and is conditioned by ground-colours of the respective stamps.

## INSECT PARASITES AND THE PLANT GENUS *MELANDRIUM*

J. W. HESLOP HARRISON, D.S.C., F.R.S.

QUITE recently my attention was directed to a paper (Baker, *The Naturalist*, January-March, 1947) which dealt with the effects of a few insect parasites upon the two British species of *Melandrium*. In discussing some of my work (Harrison, 1942), the writer makes certain criticisms, and asks for further information about my plants. It is proposed to reply to the criticisms now, and, at the same time, to supply the desired facts. In addition, certain shortcomings in Baker's observations will be indicated.

### *Contarinia steini* Karsch.

In 1942 I reported that, as the outcome of an infestation of a white-petalled form of *Melandrium dioicum* by *Contarinia steini*, it developed pink flowers. Baker begins by claiming that his results conflict with my deductions, and then proceeds to recount certain observations of his own and of Mr. C. R. B. Williamson. All that these demonstrate is his apparent unawareness that two (and quite possibly three) genetically distinct white flowered forms of *M. dioicum* exist, for he puts forward no evidence that the composition of the material concerned was tested genetically. On the other hand, I have two of these possible strains in cultivation, and upon them have based a considerable amount of experimentation. One of these strains originated in the infested plant which provoked Baker's remarks.

My experiments have demonstrated emphatically that my explanation of the observed facts was correct, and that my second form would be unlikely to respond similarly. A full account of this work will appear later.

Baker asks if any of the flowers on my original plant were free from larvae and displayed white petals. He himself provides the information that the earlier flowers were white; but if he is really enquiring whether non-infested flowers opening subsequently to the infestation were white, then I can assure him that they were. Moreover, I have the plant still, and in the greenhouse throughout 1943, 1944, 1945 and 1946 it has continued to yield white flowers. In 1947, although the plant is still alive, it did not flower.

### *Hadena bicruris* Hufn.

This is the now generally accepted name for the insect which Baker designates *Harmodia capsicola*. In opening his discussion, he makes the announcement that it is one of the moths which pollinate *Melandrium album*; no reference whatever to the equally certain fact that it visits *M. dioicum*. We are then informed that it is more directly parasitic upon both species, and 'particularly' upon the hybrids between them. This alleged preference for hybrids is quite incomprehensible, and has absolutely no foundation in fact. Both in mixed populations in nature, and in my experimental plots, from observations made over a long period of years, I can assert that the insect shows no signs of discriminatory selection when engaged in the operation of oviposition.

He returns to this point in his penultimate paragraph, but there it appears in a modified form in the assertion that *M. dioicum* is parasitised, but not often pollinated, by these moths. From this, coupled with an assumption of the more primitive nature of *M. dioicum*, and by an obvious *non sequitur*, he urges the possibility that the parasitic habit preceded the pollination effect. Perhaps I should interject here that, to my certain knowledge, *H. bicruris* plays but little part in pollinating the campions; that function is generally carried out by



*Plusia gamma*, *P. chrysis*, *P. bractea*, *P. iota* and *P. pulchrina*, with a sprinkling of species appertaining to various other genera.

Also bearing upon the same point of a preferential larval food-plant, it should be mentioned that *H. bicruris* finds plants of the genus *Dianthus* equally suitable when such are available in gardens. In addition, last season, when a Bulgarian hermaphrodite *Melandrium* species was grown amongst my cultures for genetic reasons, it duly produced its quota of larvae; an observation also having some bearing upon the point to be taken up now.

Baker informs us that staminate flowers are not attacked. This is neither in accord with my own field notes, nor is it in precise agreement with the facts presented in the preceding paragraph. I have, on many occasions, seen small larvae on staminate plants. These wander freely and, eventually, in most instances, reach developing capsules on neighbouring female plants.

Dealing with well-grown larvae, Baker says that, when they become too large for a capsule, they may migrate to another flower. Clearly, he has never examined, or beaten, a bed of campions at night. Had he done so, he would have discovered that the larvae in their last instar pass readily from capsule to capsule. Further, accepting his statements that the larger larvae seek shelter during the day in the soil, and return at night as resulting from his own observations, I can only assert that they are not in harmony with mine. In my experience, even when full grown, the larvae spend the day in the capsules, often with much of their bodies exposed and, more rarely, amongst the leaves of the food-plant.

Further, it may be asserted, without fear of contradiction, that the insect is never bivoltine in Scotland and the North, and only irregularly so in the South. In fact, the moth is notorious as being one of the species capable of passing several winters in the pupal condition. There can, therefore, be no correlation over the major part of its British range between the existence of two broods of larvae and the two alleged periods of flowering of the campions.

Lastly, in the concluding paragraph of his remarks on the campion moths, we have other species introduced. These are *Hadena cucubali* Fuessl. (appearing as *Harmodia cucubali* Friessl.) and *H. nana* Rott. (= *conspersa* Esp.) masquerading as *H. nana* (Rott.) Eupl. Comment here seems needless.

*Brachycaudus* (*Anuraphis*) *lychnidis* L.

Under this heading the aphides, or aphidids (not aphids as Baker writes), attacking campions are considered. The insect in question is very prevalent on both *Melandrium* species, and occurs in great numbers on *M. dioicum* var. *zetlandicum* on the Isles of Tiree, Rhum, South Uist and Muldoanich. Our author states that, although the attacks of these 'aphids' must weaken the plants, their effects are not sufficient to be obvious. All that I can say is that, in bad infestations, I have seen growth completely suppressed, and the plants rendered incapable of flowering.

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#### NOTE ON TRANSPLANT EXPERIMENTS AT HOTHFIELD HEATH, EAST KENT (V.C.15)

IN course of ecological field studies connected with a research thesis, certain species of bog plants have been planted on carefully marked sites at Hothfield Heath, E. Kent. The object of this is to test certain views on plant distribution and ecology. The species planted do not occur at present as natives at this locality, so this note is published as a warning to any botanists visiting the heath not to record these species as new discoveries. They are also asked to respect the experiments by not disturbing the plants, or pegs marking quadrats or transects.

The species transplanted here are :

*Lycopodium inundatum*.  
*Rhynchospora alba*.  
*Rhynchospora fusca*.  
*Drosera longifolia*.  
*Oxycoccus quadripetala*.

*Eriophorum vaginatum*.  
*Scirpus caespitosus*.  
*Apium inundatum*.

F. ROSE.



# HYDROSCHENDYLA SUBMARINA (Grube) IN YORKSHIRE : WITH AN HISTORICAL REVIEW OF THE MARINE MYRIAPODA

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DURING a holiday in August, 1947, Dr. J. E. Smith found a number of centipedes on the shore at Cloughton Wyke, Yorkshire, living under rocks and weeds below high-water mark. He collected four specimens, comprising both sexes, which I have no hesitation in referring to the species *Hydroschendyla submarina* (Grube). Brölemann (8) gives the following synonyms: *Geophilus* (*Schendyla*) *submarina* Grube, 1869 (15); *G. submaritimus* D. W. T. (Thompson), 1889 (36); and *G. (Schendyla) submarinus* Camus, 1892 (9). Grube's specimens were taken at St. Malo.

*Hydroschendyla submarina* is an extremely rare species which has not been found in the British Isles since 1889 when it was discovered by Sinel in Jersey (36). It was previously known from Polperro, Cornwall, where Laughrin found it nearly 80 years ago (29) in association with *Scolioplanes maritimus*, the second of the two species of marine Chilopoda in Western Europe (17, 26, 30, etc.). *S. maritimus* (Leach, 1817) (18) was not known to Newport (22) who, in his monograph, merely published Leach's description without comment: it was rediscovered some fifty years later near Plymouth, by Parfitt (23, 24, 25), who suggested that it was a rare species despite the fact that Leach had written: "Habitat in Britannia inter scopulos ad littora maris vulgissime" (18). Whereas *Hydroschendyla submarina* has been found only in Cornwall, Jersey, and now Yorkshire, *Scolioplanes maritimus* occurs in several localities and is evidently widely distributed. Pocock, who found a large number of specimens at Portishead, on the coast of Somersetshire, recorded examples in the British Museum (Natural History) from Bexhill (Scherren) and Polperro (Laughrin) in England; and from Portmarnock, Co. Dublin (Carpenter), and the coast of Galway (Thompson) in Ireland (29). Outside Great Britain, the distribution of the two species is as follows: *Hydroschendyla submarina*—coasts of France, (Channel, Atlantic, Mediterranean), Scandinavia, Italy, North Africa, Bermuda, etc.: *Scolioplanes maritimus*—North Sea coast of France, Denmark, Sweden, and Germany (3, 4, 8, 9, 10, 13, 15, 18, 20, 21, 30, 32).

Chamberlin (10), and Brölemann and Ribaut (7), doubt the correctness of Berlese's identification of *H. submarina* recorded from Portici, near Naples (4). Silvestri, however, in 1903, recorded six Myriapods from the shore at Portici: namely *Pachymerium ferrugineum* (C. Koch), *Clinopodes poseidonis* Verh., *Henia bicarinata* (Mein.), and *Hydroschendyla submarina* (Grube), (Chilopoda); and *Polyxenus lapidocola* Silv., and *Isobates littoralis* Silv. (Diplopoda). He suggested that, littoral Myriapods may be more frequent than is generally supposed, but distinguished between (a) accidental halophilous forms such as the three species of *Lithobius* found in Normandy by Gadeau de Kerville (14); (b) indifferent halophilous Myriapods (eight species); and (c) genuine halophilous Myriapods, viz. *Scolioplanes maritimus*, *Clinopodes poseidonis*, *Hydroschendyla submarina*, *Polyxenus lapidocola*, and *Isobates littoralis* (34). It is evident that Silvestri was referring to the '*H. submarina*' of Berlese.

In 1935, Bagnall discovered the first British shore-dwelling Pauropod, *Thalassopauropus remyi* Bagnall, a 'minute and very slender Pauropod . . . to be found under rocks deeply embedded in sand well below high-water mark on the coast of the Firth of Forth in the Dalmeny estate, near Cramond" (1). Later that year he found four more species in the same area: *Allopaupopus thalassophilus* Remy, *A. danicus* (Hans), *A. littoralis* Bagnall, and *A. stepheni* Bagnall (2). In a letter (10/2/1948) Dr. Bagnall informs me that he has since collected several other new halophilous Myriapoda not yet described.

The only record of marine centipedes from America of which I am aware is that of *Pectinunguis americanus* Chamberlin, occurring under seaweed, driftwood, etc., on the coasts of the Gulf of Mexico, including Florida, and the coasts of lower California; and *Hydroschendyla submarina* in the Bermuda Islands (10). The latter live in muddy situations around the edges of eroded flat stones, and in isolated honey-combed blocks of limestone about nine inches below mean high-water. They eat leodicids, biting them, licking up their juices, and carrying off the fragments into which the worms autotomise.

Crossland has collected marine centipedes (unidentified) from the Cape Verde Islands in 1904, and the Galapagos in 1924. In the former case the centipedes

inhabit crevices in the crust of *Melobesia* and *Vermetus* tubes, which cover all rocks at low tide inside bays, and in the latter, large empty barnacle shells also at low-tide level and surrounded by a purely marine fauna (12). Bonnell obtained a number of Geophilid centipedes 'from under stones and soft moist soil along with Polychaete worms of the genera *Lycastris* and *Marphasia*' in the bed of the Cooum River (Madras) in 1928 (5). They were described as *Mixophilus indicus* gen. et sp. n. by Silvestri (35). As a result of experiments on their resistance to submersion, Bonnell concluded that little air is required by this species; the tracheae store enough for 24 hours, and in addition air is entangled by a loop of the posterior end of the body and in chitinous channels in the coxae of the last legs (5). In this they appear to differ from *Hydroschendyla submarina* and *Scolioplanes maritimus* of which Plateau concluded that there is nothing extraordinary in the properties of these Myriapods (essentially terrestrial Geophilids) to resist sea-water for long periods, since many non-swimming Arthropoda with aerial respiration frequenting the sea shore allow themselves to be submerged. The resistance to submersion is not correlated with any special respiratory structure, nor with the existence of a layer of air or protective varnish; it is a general property of non-gilled Arthropods, nearly all of which can resist asphyxiation for remarkably long periods, e.g. *Geophilus longicornis*, 12-72 hours in salt water, 6-15 days in fresh. Plateau's experiments gave him reason to think that, if transferred to the shore, terrestrial Geophilids could resist the action of the sea and would not die except as a result of the absence of suitable food. This supposition was strengthened by a letter from Moniez (11/12/1889) who stated that he had found *Scolioplanes acuminatus* Leach under stones covered at high tide (26). The only reference to the resistance of centipedes to water before that of Plateau, is a statement of Gervais, cited by Lucas (19), to the effect that *Geophilus* can live after two days' submersion. In 1901, Rossi wrote that millipedes (*Iulus*) could survive prolonged immersion, whereas centipedes (*Scolopendra*, *Lithobius*, *Scutigera*, etc.) showed plain signs of discomfort when thrown into water, and never survived more than three or four hours. He suggested that there is active cutaneous respiration in millipedes, but not in centipedes; while the respiratory process in Diplopoda is very slow compared with that of Chilopoda which cannot resist inert gases for long (31). The following year, Silvestri disagreed with the possibility of submerged Diplopoda absorbing air through cuticular pores (33); and in 1903, Hennings, who also experimented on the resistance to submersion of these species, and particularly *Scolioplanes maritimus* which can survive 30 hours' submersion in sea-water, and 70-80 hours in fresh, concluded that many Myriapods possess this adaptability to a greater or lesser degree (16). Verhoeff found that millipedes lightly placed on the surface of quiet water remain floating because of adherent air for periods up to 15-26 days (the resistance to water varying greatly in different genera), and pointed out that the results obviously do not apply to running water affected by currents and waves, and do not imply an ability of these millipedes to cross streams (37). More recently, the behaviour of Myriapoda under water has been described by Schubart (32), and Cloudsley-Thompson (11).

#### SYSTEMATIC NOTE

In his letter to *Nature* in 1889 describing the finding of *H. submarina* (incorrectly called *submaritima*) in Jersey, Thompson wrote: 'Dr. Latzel, of Vienna, tells me that the specimens differ somewhat from the type, and probably constitute a well-marked variety' (36). The following year, Moniez named this var. *egregia* Latzel (21). In a letter to Brölemann and Ribaut, Latzel gave as his reasons for suggesting the proposal, the fact that var. *egregia* differs from Grube's type by the terminal legs having six instead of seven segments, by the presence of 2+2 coxal glands, and by the pilosity of the posterior part of the body.

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## THE WHITE-TAILED EAGLE

T. LOVETT, M.B.

THE report of the recent appearance of the Sea Eagle (*Haliaeetus albicilla*) in Yorkshire has suggested that it might be of interest to place on record some notes of the last breeding pair of this rare bird in the British Isles.

About 40 years ago there were two well known pairs nesting in the Shetland Islands, one on the west side of the Island of Yell, the other on the west banks of the parish of Northmavine. In the year 1908 the male bird in Northmavine was found dead on the moors not far from the eyrie and about the same time the female bird in Yell disappeared and it was generally believed it had been shot by a 'collector.' Shortly after this the female in Northmavine was joined by a male bird, probably the one bereaved in Yell. These two birds lived there for several years. The local bird watcher, Mr. Hay, of North Roe, had built an excellent observation post, which could be entered unseen by the birds and from which every detail of the nest and birds could be watched.

I was Medical Officer of the Parish of Northmavine from 1909 till 1915 and often visited this hideout. It was a scene of wild grandeur where the sheer sea cliffs rose for 250 feet, overlooking the western ocean. The nest itself was on a ledge under an overhang.

The female was seen on or near the nest more often than the male. Local tradition gave her a great age and her tail was greyish rather than white. They used the nest all the year round and the same nest year after year. To see these magnificent birds, about the same size as the Golden Eagle, on the nest or in the air in their natural surroundings is a sight never to be forgotten.

During my stay in Shetland eggs had been seen in the nest, but Mr. Hay is certain no young had ever been hatched. The robbing of the eggs by collectors would have been a difficult and dangerous job\* and could not have been done without the knowledge of such a keen watcher as Mr. Hay. About 1913 the male bird disappeared, perhaps tiring of his infertile mate and the female continued to stay there alone.

My last visit to the hideout was in August, 1914, when I was fortunate in seeing an unusual sight. The eagle was sitting alert on the ledge beside the nest. Two crows were flying near. One perched a few feet above it while the other darted close past the eagle in a noisy and aggressive manner. While the eagle without leaving the ledge struck out with beak or claw, the other crow darted down and attempted to peck the eagle on the head. This went on for quite a while, the crows often changing station. The eagle was obviously worried and entirely on the defensive. The crows never actually struck the eagle and one stroke of the big bird, had it got home, would have finished the crows. Finally the eagle took to the air, not to show fight but to escape. It disappeared round a headland with the crows in hot and vicious pursuit.

The end can only be conjectured but as far as I know this eagle was never seen again. Since then there have been isolated records of sea eagles having been seen, but no instance of their nesting in the British Isles.

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\* A Yorkshire rector (now deceased) who called on me in 1921 to borrow Shetland slides effectively barred his chance of success by the claim he made to have taken the last eggs of the White-tailed Eagle in Britain. I believe he had been prosecuted and fined!—R.C.

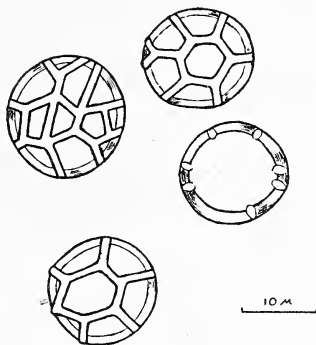


**TILLETIA (?) SPHAGNI Nawaschin: A NEW BRITISH RECORD**

D. WALKER

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CAPSULES of *Sphagnum papillosum* Lindb., collected from the bog bordering Blelham Tarn, near Ambleside, on the 24th of March, 1948, were found to contain not only a few typical *Sphagnum* spores, but also many smaller bodies as figured in the diagram. These latter were tentatively identified as smut spores by Dr. T. E. T. Bond of this Department, and further investigation proved them to be the spores of *Tilletia* (?) *sphagni* Nawaschin. They agree excellently with



M.E.B.

Camera lucida drawings of a permanent preparation of the spores of *Tilletia* (?) *sphagni* Nawaschin (Shëff. Myc. Herb. 110). The spore on the right is shown in optical section; the others are in surface view.

Nawaschin's (1894) original figures and description, and with the recent account given by Liro (1935-38); although Ciferri's (1938) diagnosis is followed less closely.

The spores are roughly spherical, of diameter  $13.2 \pm 1.4 \mu$  (from 50 measurements) and coloured brown in nature. Their surface is coarsely reticulate. All attempts to induce the germination of these spores have failed, and more capsules obtained from the same locality on the 16th May, 1948, were found to be uninfected.

Not only is this the first British record of this fungus (Sampson, 1940), but also the first record of its occurrence on *Sphagnum papillosum* Lindb., although it has been found on many other *Sphagnum* species in Europe. According to Liro (1935-38), related forms have been reported from other genera of the Bryophyta. Similar, if not identical, spores are commonly found in British peats and have been recorded as 'moss spores' by pollen analysts (Conway, 1948).

I am indebted to Professor A. R. Clapham and the staff of this Department for their help, particularly in obtaining literature, which otherwise would not have been available to me.

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## A NEW BOLETUS

A. A. PEARSON, F.L.S.

THE following is an addition to the British species included in the short monograph of the genus *Boletus* which appeared in *The Naturalist*, July-September, 1946. It would be placed after *B. subtomentosus* in the section *Xerocomus*.

*Boletus leoninus* Pers.

*Pileus* 5-8 cm. convex then flat and depressed dry, bright tawny or tan yellow with a slight sulphur or lemon tint here and there, changing to a pale reddish clay, covered with a close tomentum which is somewhat arachnoid; mat; margin incurved.

*Tubes and Pores* wax yellow with a very slight lemon tint, brownish when rubbed, adnate emarginate, pores small and irregular.

*Stem* lemon yellow above, dingy reddish brown below, ventricose fusoid, minutely tomentose, solid and firm.

*Flesh* pure white almost unchangeable except for reddish tinge above the tubes and yellow outline near the surface.

*Spore Powder* Citrine (Ridgway) which is lighter in colour than the olive-green spores of many species.

*Spores* fusoid-apiculate smooth,  $10-13 \times 5-5\frac{1}{2} \mu$ .

*Cystidia* sparse, flask-shaped, hyaline.

This very rare *Boletus* has not often been recorded and the details given by the old authors do not always tally, because they have often been taken from old specimens. The above description was made from two fresh examples gathered by me in the New Forest, Hampshire, on the 20th October, 1947, after a prolonged drought.

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**Territory in Bird Life**, by Eliot Howard. Pp. 224, with 12 page illustrations in monochrome by G. E. Lodge and H. Gronvold. Collins, 10/6.

A new edition of a famous book of 1920 that influenced ornithological thought profoundly, and is somewhere referred to, mainly with approval, by almost every ornithological writer since. Eliot Howard did not discover territory as a factor in the lives of birds; the word was often used before 1920. What he did was to insist on its paramount importance to all species, transcending almost all problems of behaviour in their daily lives, and perpetuating of species and race to a degree far beyond any previous conception. Song, display, combat, food supply, migration, psychology, the need for seclusion in spring, for living gregariously in winter, are related to territory in excellent prose and argument, with a wealth of relevant, observed incident. The species mainly used are common, Reed-Bunting, Yellow Bunting, Chaffinch, sundry Warblers, Lapwing, Waterhen, Guillemot and others. The actions described can thus be verified by the reader, who can find highly interesting work in an attempt to prove (or otherwise) that the behaviour of other species, or of the same species in territory of a different type, further supports Howard's arguments, and to trace the achievement of the same 'biological ends for which the territory has been evolved.'

Howard watched spring migrants following the course of the Severn, 'and where the river bends to the north-west at Lincombe Lock, there they leave it, or rather, continue in a north-easterly direction,' which may bring some of them to South Yorkshire and the Humber, and Spurn, and beyond. When he wrote of 'the influence exerted by the internal secretions,' I was always inclined to ask if the occurrence of such secretions was not a phase in a cycle, an effect rather than a prime cause. When (twice) he refers to the Herring Gull as normally rearing four young, one wonders where; I never knew more than three. An odd misprint or two occur: reference to the original edition confirmed that 'Whit-chat' should read 'Whin-chat.' The illustrations mainly represent birds in fighting attitudes as imagined by the eminent artists under Howard's direction.

This book, by a great naturalist who died in 1940, is deservedly a classic, and those who have not the first edition should take the opportunity to have it on their shelves. As Huxley and Fisher say in an introduction, 'The general biologist no less than the naturalist should read and ponder this book.' And it should not be without value for the ecologist.

R. C.

# THE MOSS *PHYSCOMITRIUM SPHAERICUM* (Ludw.) Brid. IN YORKSHIRE

E. C. WALLACE

HAVING heard that the lake at Copgrove Hall had been dry all last summer, and that the bed was covered in vegetation, I decided, whilst staying with Dr. W. A. Sledge last October, to visit the site. A bryologist should never neglect to examine dried-up ponds and the like, for many ephemeral species of mosses and hepatics are usually to be found. The sloping banks and part of the bed were covered with rank vegetation, but several square yards of dried mud supported scattered colonies of various mosses. Most of them were in a young stage of growth and difficult to identify at sight, but *Phascum cuspidatum*, *Pottia truncata*, *Barbula convoluta*, *Bryum atropurpureum* and *B. argenteum* were easily recognised. Here and there grew *Funaria hygrometrica* in various stages of growth, some small patches of *Physcomitrella patens*, and sparingly with this a plant in young fruit which I recognised immediately as being *Physcomitrium sphaericum*. I cannot trace a previous record of its occurrence in Yorkshire.

This is a rare plant in Britain, and in Europe, and by reason of its habitat—the mud of dried-up ponds—not often seen year by year in its recorded localities. It was first found in Britain by William Wilson on the dried mud of a pool at Mere in Cheshire in September, 1834, and apparently not seen there again until 1868. J. E. Bagnall claims the second locality in Britain for Staffordshire at Pottal reservoir (*Journ. Bot.*, 1896, p. 76), but Prof. T. Barker had found it at Milton (Coombes) Reservoir in Derbyshire in 1893 (*Journ. Bot.*, 1894, p. 196). It is interesting to note that he records *Physcomitrella patens* and its variety *Lucasii* from the same locality as found in 1887 when apparently he did not see the *Physcomitrium*; though conditions were presumably favourable.

Further localities have been recorded as follows:

- V.C. 58, Cheshire: Whaley Reservoir, Sept. 1893, Oct. 1901, T. Barker.
- V.C. 17, Surrey: Hedge Court Millpond, H. W. Monington (date uncertain, before 1904), and Oct. 1921, W. E. Nicholson.
- V.C. 14, East Sussex: Holtys Common, W. E. Nicholson, between 1908 and 1915.
- V.C. 16, West Kent: St. J. Marriott, about 1920.
- V.C. 85, Fife: (*Supp. to Census Cat. British Mosses*, 1935, pub. by Brit. Bryological Society).

The Copgrove plant rather shrivelled on drying, so that the form of its characteristic spherical capsule on short thick seta was lost. I saw no mature capsules, though carefully looked for as it was late in the season. By a coincidence the plant occurred again last year in Derbyshire at Coombes reservoir, where Mr. R. H. Hall, of Buxton, observed it after some years' search. He has kindly communicated his notes to me and writes: 'In spite of special searches I did not re-discover it in this station until August 5th, 1947. The lake was at a lower level than I have ever seen it before, and a very extensive stretch of shore mud supported a most luxuriant growth of *P. sphaericum* associated with *Physcomitrella patens*, and, on the date of discovery the fruits of the former were in many cases mature. On October 26th, 1947, I revisited the lake and worked the north shore, where I found the plant widely distributed, though not so plentiful as on the south side. The position of the plants on the shore mud was of considerable ecological interest. Owing to the prolonged drought the mud was covered with fissures of  $\frac{1}{2}$  in. to 1 in. across. The surface was almost completely devoid of plant life, apart from colonies of the alga *Botrydium granulatum*, but the vertical sides of the fissures were richly covered with *Physcomitrium sphaericum* associated with *Pseudephemerum nitidum* (*Pleuroidium axillare*).'

There were a few cracks in the mud at the Copgrove Hall lake, but I did not find any of the moss except on the flat surface, nor did I see *Pleuroidium axillare*, which is frequently found on dried-up ponds as well as at the sides of muddy rides in woods.

The occurrences and ecological requirements of *P. sphaericum* raise some problems by no means easy to solve. It is not known how long dormant spores can (in this species) retain their viability whilst under water, awaiting exposure to the air by drought and favourable conditions for growth.

The Copgrove locality is never normally available to the moss, as the level of the lake is kept up by a stream traversing it and a sluice. There is a small pond within a few hundred yards which might provide the necessary conditions for growth of mud-loving mosses, but nothing has been recorded from it, though such species may occur there occasionally.

Regular observations over a period of years at the known localities for *P. sphaericum* may throw light on the problems raised by the erratic occurrences of this species.

An even rarer plant in England is *Nanomitrium tenerum*, which has only been found in a few similar habitats in Kent, Surrey and Sussex at long intervals.

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**Field Book of Beetles**, by John R. Dibb. Pp. xxv+14 plates+197. A. Brown & Sons, Ltd., 21/- net.

After the Lepidoptera, the Coleoptera have received more attention than any other order of British Insects. As a consequence there are available to the student several very good books of reference and many smaller publications. There are none, however, which cover the ground in the same way as Mr. Dibb's book which is unique in its approach to the subject.

The Field Book, it should be emphasised, is intended for use in the field and not for critical work at home, and supplies the long-felt want of a portable volume for rough field determinations for the less experienced and a 'remembrancer' for the more advanced worker. The arrangement is basically ecological, and depends for its satisfactory use on accurate field observation. The habitat-groups are linked with a series of excellent line drawings which enable systematic subdivisions as low as tribes to be recognised. Under each habitat-group the respective systematic categories are keyed to the species. Since many beetles are found in several habitat-groups these are duplicated as often as necessary in the keys. For practical reasons Mr. Dibb has limited his book to some 2,500 out of the total 3,700 British beetles (and herein lies a fundamental weakness of which the author is fully aware). The genera omitted are indicated in the excellent index to the book and the number of British species these include are also noted. As the author points out this limitation may tend towards some misidentifications by inexperienced coleopterists and final checking by a fuller description is imperative in nearly every case. The possibility of error can be minimised by care and by the use of precautions common to all systematic work.

A far more serious source of difficulty is likely to occur in some instances. It is much to be regretted that Mr. Dibb did not include a simple key to the tribes to supplement his illustrations. These tribes by their very nature are not always of a homogeneity sufficient for all their species to be recognised by a single illustration, and some tribes are so closely similar in grosser characters as to be inseparable by illustrations alone, as for instance some species of the *Harpalini* and *Amarini* (Plate 2, figs. 16 and 17). The beginner also will be puzzled to find a difference between the *Agonini* and *Amarini* (Plate 2, figs. 19 and 17) without some verbal assistance, and in the *Carabidae* at least (notoriously homogeneous insects) perhaps illustrations to sub-families only would have been generally less confusing to the beginner. The above criticism does not apply to most of the other groups used as many possess characters which can be clearly detected in Mr. Dibb's accurate drawings.

The keys are built up on simple and easy characters and lead to the species. An abbreviated indication of the Britannic range of each species might have been added with advantage and without using much more space. Misprints are few and no serious errors were noted.

The get-up of the book leaves nothing to be desired and we like, particularly, the rounded corners, pocket-size and habitat-group headings at the tops of the pages. The printing is exceptionally clear and the paper of good quality.

Mr. Dibb's book will be of the greatest value to the young collector and to the field naturalist and may well be the means of attracting many new recruits to the study of one of the most interesting orders of British Insects. We offer our sincere congratulations to the author and we cannot refrain from adding a word of praise for the work of the printers.

W. D. H.

*The Naturalist*



## THIRSK, May 15th-17th

THE 1948 Whitsuntide meeting was favoured with pleasant weather and with a carefully-planned series of excursions. Miss C. M. Rob initiated the meeting in October, 1947, when she was divisional secretary for this vice-county. She had the assistance of Mr. J. P. Utley and the hard work done by them had its reward in the very successful meeting enjoyed by the members who attended.

The areas visited were of different types: first, the Boltby district with two gills, Gurtof and Lunshaw with their interesting streams, then the flat and marshy country at Pilmoor, and finally the picturesque lake of Gormire.

This year has given some wonderful flower displays and the Hawthorn blossom and the Bogbean flowers in the small lake at Gormire will long be retained as pleasant memories.

The varied series of rocks was shown by the mosses in Gurtof gill. At the lower end the stream had normal types like *Eurhynchium rusciforme*, *Hypnum palustre*, *Brachythecium rivulare* and *Fontinalis*, but as we got further up and the slope steeper these were replaced by a fine growth of *Hyocomium*, a typical gritstone stream plant, whilst up on the steep sides of the gill a series of springs provided many wet masses of *Hypnum commutatum*, a very definite lime-lover. By the stream sides a daddy long-legs, *Tipula vittata*, was in fair numbers. This species is not very common, especially further south. The Pearl-bordered Fritillary and Brimstone were two butterflies which attracted attention and were a forerunner of the wealth of the Gormire district.

At Pilmoor a fly that attracted attention was the mosquito, *Aedes punctor* (*Culex nemorosus*), a persistent biter. The large horse-fly, *Tabanus bisignatus*, was caught but was not yet plentiful. The sun-loving robber flies living on the sandy places were represented only by *Lasiopogon cinctus*. The ponds at Pilmoor are much reduced in area and filled up with vegetation. The moss, *Orthodontium*, now plentiful here, was not noted by botanists prior to the war.

At Gormire the net of the freshwater biologist worked by Mr. H. Whitehead caught a larva which later hatched out into the fly *Mochlonyx*, a species which may possibly be overlooked as *Corethra*. We have only two previous records for it in Yorkshire. Members who knew Gormire years ago agreed that Pillwort has increased considerably, but *Hottonia* was not very evident and is much less in quantity at present.

At the meeting, presided over by Mr. R. Chislett, reports were presented and we were glad to have one on galls from our London member, Mr. Burkill. A very hearty vote of thanks to the landowners for the kind permissions to visit their estates was carried on the motion of Mr. Holmes, and Miss Rob and Mr. Utley were thanked for their share in the success of the meeting.

**Flowering Plants** (W. A. Sledge): The ground visited on all three days has been very thoroughly worked over in the past by J. G. Baker and three generations of the Foggitts. Botanically, Gormire and Pilmoor especially are two of the best-known and most frequently visited localities in North Yorkshire and their floras have been so well explored that chief interest centred in a comparison of the past and present frequency of certain species. Additions to the list of species already known to occur there were not to be expected, although some *Viola canina* L. found at Pilmoor has not previously been recorded.

Gurtof Wood is composed principally of Birch with Alder by the stream and Sessile Oak and occasional Mountain Ash and Holly elsewhere. In the lower, more open part of the gill there is much Bracken which gives way to Bilberry in the woodland with frequent hummocks of *Leucobryum glaucum* Schp. It was not to be expected that a woodland of this type would yield many species. The habitat was suitable for *Trientalis* and a few patches were seen with several plants already in flower. *Primula farinosa* L., mentioned in the circular as having been seen at Gurtof sixty years ago, was not met with, nor did I see any ground in which it might have been expected to grow. Above the wood there was a little *Vaccinium Vitis-Idaea* L., and Sundew (*D. rotundifolia* L.) and Cotton-grass (*E. vaginatum* L.), the latter already in fruit, were seen on the moor in crossing over to Lunshaw Gill in which *Littorella* was plentiful on the edge of the reservoir. *Mentha rotundifolia* (L.) Huds. was gathered in an old station near Paradise Farm and *Ophioglossum vulgatum* L. in Gurtof Gill.

Pilmoor consists of a Birch heath on a mixture of peat and sand with swampy hollows containing marshes and pools of water. Alder Buckthorn (*Frangula alnus* Mill.), Oak (*Q. Robur* L.), Hawthorn, Bramble and Willow (*S. atrocinerea* Brot.) are the most common of the larger shrubs after Birch. Not much open water now remains; the swampy hollows are gradually filling up and the rank growth of rushes and sedges has ousted some of the smaller and rarer marsh plants (e.g. *Lycopodium inundatum* L. and *Pilularia*) which at one time occurred here. Others have decreased greatly in quantity in recent years (e.g. *Hypericum elodes*, *Gentiana Pneumonanthe* L. and *Deschampsia setacea* (Huds.) Hack.) and will probably soon vanish. The common plants of the marshes are now *Comarum palustre* L., *Menyanthes*, *Juncus effusus* L., *J. acutiflorus* Hoffm., *Eriophorum angustifolium* Honck., *Carex rostrata* Stokes, *C. elata* All. and *Equisetum limosum* L., with *Ranunculus Flammula* L., *Lotus uliginosus* Schkuhr, *Hydrocotyle*, *Cirsium palustre* (L.) Scop. and *Utricularia vulgaris* L. and much *Sphagnum* and *Aulacomnium palustre*. Some *Genista anglica* L. occurs in the drier parts and *Viola canina* L. (not previously recorded), *Teesdalia*, *Ornithopus perpusillus* L., *Ophioglossum* and *Calamagrostis Epigeios* (L.) Roth., were the most interesting of the other plants seen. The last-named species was also seen in abundance in Sessay Wood, where we were able to verify the continued occurrence of *Paris* and *Convallaria* and to see the well-known tree of *Sorbus intermedia* (Ehrh.) Pers.

At Gormire, *Pilularia* and *Lysimachia thyrsiflora* L. are happily still as abundant as ever. The lake yielded in addition *Apium inundatum* (L.) Rchb. f., *Pepils Portula* L., *Littorella* and *Potamogeton alpinus* Balb. Both here and at Little Gormire, where *Hottonia* was seen, Marsh Cinquefoil and Bogbean are abundant and the remarkable display of *Menyanthes* flowers at Little Gormire seen against a background of massed Bluebells on the rising ground beyond, will not soon be forgotten by those who saw it. *Myosotis sylvatica* (Ehrh.) Hoffm. was also in full flower nearby and in the turf not far from the lakes there were a few plants of *Botrychium* and a quantity of *Ophioglossum*.

*Alchemilla xanthochlora* Rothm., *A. vestita* (Buser) Raunk. and *A. glabra* Neyg. were collected at Gurtot Gill, the first being seen also at Little Gormire.

**Bryology** (A. Thompson): A number of bryologists were present on the excursions, but the list of bryophytes prepared by them contained very few of any but the commonest mosses and hepatics. Over 50 species of mosses were gathered on the Boltby walk, but not so many on the other two days. In Gurtot Gill *Tetraphis pellucida* Hedw. with capsules and a rather poor specimen of *T. Browniana* Grev. were found. Four common species of *Polytrichum* were abundant everywhere and *Orthodontium gracile* Schwaeg. var. *heterocarpum* Wats. was plentiful.

*Hypnum cordifolium* Hedw., some of it with capsules, occurred in great quantity at Pilmoor and Gormire, with *H. aduncum* Hedw. and *H. exannulatum* Guemb. *H. giganteum* Schp. and least common of all, *H. lycopodioides* Schwaeg. were both found at Pilmoor.

On old Elder trees in the wood by Little Gormire there were two *Orthotrichums* growing alongside Jew's-ear fungus, *O. pulchellum* Smith and *O. affine* Schrad. *Philonotis capillariss* Lindb., gathered by Mr. Shaw on the margin of Gormire and determined by Mr. J. B. Duncan, is new to V.C. 62.

Little work was done on hepatics but *Lophozia attenuata* (Mart.) Dum. was found in Gurtot Gill.

**SPHAGNA** (A. Thompson): The eastern side of V.C. 62 has been very well worked in the search for these plants so that not much in the way of new records could be expected. The only *Sphagnum* that had not been noted before was found on the edge of Gormire, viz. *S. auriculatum* Schp. var. *canovirescens* Warnst.

As there seems to be no previous lists of bog-mosses from the Thirsk side of the area all the finds are given below. Many more no doubt will be made on further search, especially at Pilmoor. P., G., B. and Gu. stand respectively for Pilmoor, Gormire, Boltby Moor and Gurtot Gill.

- S. fimbriatum* Wils. var. *robustum* Braith., P.
- var. *validius* Card., P., G.
- var. *intermedium* Russ., P., G.
- var. *tenue* Grav., G.
- var. *laxifolium* Warnst., P., Gu.

- S. molle* Sull. var. *limbatum* Warnst., an uncommon plant, G.  
*S. compactum* DC. var. *subsquarrosus* Warnst., large patches on B.  
*S. squarrosus* Pers. var. *spectabile* Russ., G.  
                         var. *subsquarrosus* Russ., P.  
*S. amblyphyllum* Russ. var. *macrophyllum* Warnst., Gu.  
                         var. *mesophyllum* Warnst., Gu.  
*S. recurvum* P. de B. var. *majus* Ångstr., Gu.  
                         var. *parvulum* Warnst., G.  
*S. cuspidatum* Ehrh. var. *falcatum* Russ., Gu.  
                         var. *plumulosum* Schp., B.  
*S. molluscum* Bruch., not very common on the Yorkshire hills, B.  
*S. obesum* Wils. var. *canovirens* Warnst., P., G.  
*S. auriculatum* Schp. var. *laxifolium* Warnst., P.  
                         var. *canovirescens* Warnst., G.  
                         var. *submersum* Warnst., B.  
*S. inundatum* Russ. var. *lancifolium* Warnst., P., G.  
                         var. *diversifolium* Warnst., P.  
*S. crassiciadum* Warnst. var. *magnifolium* Warnst., P.  
                         var. *intermedium* Warnst., P.  
*S. papillosum* Lindb. var. *normale* Warnst., B.  
*S. cymbifolium* Ehrh., P., G., Gu., B.

**Fungi** (W. G. Bramley): The extremely fine and warm weather was not conducive to collecting. A few agarics were seen chiefly round the pond sides at Pilmoor and amongst the *Sphagnum* at Gormire. Of the Uredines most of those seen were the common spring series, none being in such quantity as to call for comment. The subjoined list contains the most interesting of the records, a full list of which is kept by the recorder. I am indebted to Miss Wakefield and Dr. Dennis of Kew for help in the determinations.

B.=Boltby.      G.=Gormire.      P.=Pilmoor.

\* Not in Mason & Grainger, *Catalogue of Yorkshire Fungi*.

† Not in M. & G. for V.C. 62.

*Mitrula phalloides* (Bull.) Chev., B.

\**Diaporthe arctii* (Lasch.) Nils., on *Arctium*, G.

\**Enchnoa lanata* (Fr.) Fr., on *Betula*, P.

\**Leptosphaeria derasa* (B. & Br.) Auersw., on *Senecio*, G.

\**L. libanotis* (Fckl.) Niessl., on *Angelica*, P.

*Pseudovalsa lanciformis* (Fr.) Ces. & de Not., on *Betula*, P.

\**Pholiota praecox* (Pers.) Fr. var. *minor*, P.

*Polyporus brumalis* (Pers.) Fr., P.

†*Corticium* (Gleo.) *albostramineum* (Bres.) B. & G., on *Betula*, P.

\**Peniophora leprosa* B. & G., on *Betula*, P.

*P. hydroides* Cke. & Mas., on *Betula*, P.

*Uromyces scillarum* (Grev.) Wint., G.

*Puccinia aegopodii* (Schum.) Mart., P.

\**P. cirsi-lanceolata* Schroet., II on *C. lanceolata*, B.

*P. epilobii* DC., on *Epilobium obscurum*, G.

†*P. major* Dietel, OI on *Crepis paludosa*, B.

\**Dinemasporium decipiens* (de Not.) Sacc., on *Ulmus*, G.

\**Helminthosporium longipilum* Corda, on *Betula*, P.

**Algae** (L. I. Scott) : The time of year and the district were favourable for the collection of freshwater algae. Collections were made from the various places visited, but these organisms do not keep well, and are impossible to identify fully without laboratory equipment and endless time ! The examination of the material has therefore been very superficial and by no means exhausts the algae present. Filamentous Conjugales were ubiquitous, but as is so commonly the case with this group, the lack of conjugation did not permit of specific identification. The commonest was *Mougeotia*, but *Zygnema* was also common. Other commonly occurring filamentous forms were *Microspora* sp. (especially in the Pilmoor ponds) and *Oedogonium*.

The more interesting collections were made from Gormire and as this was the last day, this material was in better condition for examination on my return

to Leeds. The aquatic vascular plants are rich in epiphytes, amongst which may be mentioned particularly the prolific growth of *Bulbochaete* on *Equisetum*; but this lake is more interesting in connection with the smaller organisms that occur in the plankton or held up in the *Sphagnum*. In the following list, the plant was collected from Gormire unless otherwise stated.

## CHLOROPHYTA

### I. VOLCOCALES

- Pandorina morum* (Müll.) Bory.  
*Eudorina elegans* Ehrenb. (Also in Little Gormire).  
*Volvox aureus* Ehrenb. (Little Gormire. *Volvox* sp. at Pilmoor).  
*Asterococcus superbus* (Cienk.) Scherffel.  
*Gloeocystis gigas* (Kütz.) Lagerh.  
*Sphaerocystis Schroeteri* (Chod.) Lemm.

### II. TETRASPORALES

- Apiocystis Brauniana* v. *linearis* (Naeg.) Rabenh.

### III. CHLOROCOCALES

- Pediastrum Boryanum* (Turp.) Menegh.  
*P. tetras* (Ehrenb.) Ralfs.  
*Scenedesmus obliquus* (Turp.) Kützing.  
*Characium Pringsheimii* A. Br. and other *Characium* sp.  
*Tetraedron minimum* (A. Br.) Hansg.  
*Ankistrodesmus falcatus* (Corda) Ralfs.

### IV. ULOTRICHALES

- Draparnaldia glomerata* (Vauch.) Ag.  
*Stigeoclonium* (*S. lubricum* ?) sp.  
*Chaetosphaeridium globosum* (Nordst.) Klebahn.  
*Coleochaete* (*scutata* ?) on *Elodea* in Little Gormire.

### V. CONJUGALES

- Arthrodesmus octocornis* Ehrnb.  
*Cosmarium Meneghinii* Breb.  
*C. praemorsum* Breb.  
*Closterium moniliferum* (Bory) Ehrenb. and other *Closterium* spp.  
*Sphaeroszoma vertebrium* (Breb.) Ralfs.  
*Euastrum elegans* (Breb.) Kütz.  
*E. oblongum* (Grev.) Ralfs.

## GROUPS OTHER THAN CHLOROPHYTA

### CHRYSPHYTA

- Botryococcus Braunii* Kütz. (Also at Pilmoor).  
*Dinobryon divergens* Imhof.  
*Ophiocytium parvulum* (Perty) A. Br.  
*Stipitococcus urceolatus* West.  
 Numerous diatoms were present but not studied.

### EUGLENOPHYTA

- Trachelomonas volvocina* Ehrenb.  
*T. perforata* Awerinzew.  
*Euglena sanguinea* Ehrenb. (Also at Pilmoor.)

### DINOFLAGELLATA

- Ceratium hirundinella* O.F.M.  
*Glenodinium uliginosum* Schill.  
*Peridinium* sp.

### CYANOPHYTA

- Coelosphaerium Kützingianum* Naeg. (Also in large pond at Pilmoor.)  
*Anabaena* sp.

Amongst the plankton organisms one of the most conspicuous when it occurs is *Euglena sanguinea*, which looks like red brickdust scattered on the surface of the water. In the tube this organism soon sinks to the bottom. It is one of the largest of the *Euglena* species and is commonly in an unflagellated condition.



*Botryococcus Braunii* also tends to form floating, pollen-like masses, but this year was not so prolific as to be conspicuous to the naked eye.

It was pleasing to find *Volvox aureus* in considerable quantity in Little Gormire. Probably it was this species also in Pilmoor, but it was not so prolific.

At Gurtof a small amount of *Tetraspora cylindrica* Wahlenb. was found.

**Ornithology** (J. P. Utley): Although no note of outstanding merit was made during the week-end the meeting was of considerable interest and success.

The Boltby excursion gave the biggest number of species, 57, Pilmoor gave 43, and Gormire 53. The total number of species seen was 68 and consisted of the following: Carrion Crow, Rook, Jackdaw, Magpie, Jay, Starling, Greenfinch, Linnet, Chaffinch, House Sparrow, Corn Bunting, Yellow Bunting, Reed Bunting, Skylark, Tree Pipit, Meadow Pipit, Pied Wagtail, Tree Creeper, Great Tit, Blue Tit, Coal Tit, Marsh Tit, Goldcrest, Spotted Flycatcher, Pied Flycatcher, Chiffchaff, Willow Warbler, Wood Warbler, Sedge Warbler, Garden Warbler, Blackcap, Whitethroat, Mistle-Thrush, Song Thrush, Ring Ousel, Blackbird, Wheatear, Whinchat, Redstart, Robin, Hedge Sparrow, Wren, Dipper, Swallow, Martin, Swift, Kingfisher, Green Woodpecker, Great Spotted Woodpecker, Cuckoo, Tawny Owl, Barn Owl, Kestrel, Sparrow Hawk, Mallard, Teal, Wood Pigeon, Stock Dove, Golden Plover, Lapwing, Curlew, Snipe, Woodcock, Moorhen, Coot, Red Grouse, Pheasant and Partridge.

The most distressing feature of the meeting was the theft of eggs from birds' nests by Carrion Crows. At Pilmoor more than 20 sucked eggs of Mallard, Teal, Moorhen, Pheasant and Partridge were found in but one small area and throughout the week-end numbers of Carrion Crows were seen flying with eggs in their beaks. Rooks were also seen at the same nefarious business, but in their case it was usually the eggs of smaller birds which were being carried, probably of Skylark, Tree Pipit, etc. Magpies and Jays were not common.

Only a few Pied Wagtails were recorded from Boltby and Pilmoor; none of the other species were seen on any day. The tit family was not numerous and no Long Tailed Tits were seen though they are known to visit the area. A pleasing note was the discovery of two locations where Pied Flycatchers were breeding; the spotted variety was seen but a few times. One or two Ring Ousel and Wheatear were seen on the high ground behind Roulston Scar. Only one Dipper was recorded from near Ranthorpe Mill; this species and also the Grey Wagtail prefer the longer, larger and more boulder-strewn gills of the western dales. Swifts were seen to visit clefts in the cliffs to the east of Gormire Lake. A Kingfisher was seen on a stream near Oldstead. Owls were scarce, being seen only at Boltby: the Little Owl was not recorded on any day. Birds of prey were not seen except at Pilmoor, where the nest of a Sparrow Hawk was found, but one Kestrel was seen near Sessay Wood. Near the latter place, in a bush and at a height of 13 feet above land there was a nest of a Moorhen. In no area could game birds be found in any numbers.

**Entomology** (ODONATA and DIPTERA) (C. A. Cheetham): The week prior to our meeting was fortunately warm and provided insects we should otherwise have sought in vain. Amongst Dragonflies the crimson *Pyrhosoma nymphula* (Sulz.) was the most widespread and plentiful at Pilmoor. The small blue *Agrion puella* (L.) was emerging in fair numbers whilst at Little Gormire the bronze-green *Lestes sponsa* (Hansem.) took its place and we saw a few of the fine large species *Libellula quadrimaculata* L.

Going up Gurtof Gill *Tipula vittata* Mg. was seen frequently but singly. It evidently lives as a pupa in the moist soil of the stream side. Another spring species, *T. rufina* Mg., was also taken here, and the strange white tarsi of *Dolichochepea sylvicola* Curt. were seen in dark corners. A possible evidence of the presence of dead sheep or other animals was the capture of the large brilliant bluebottle with a golden face, *Cynomyia mortuorum* (L.) and the dull squat *Protocalliphora groenlandica* (Zett.) *Hydrophoria conica* (Wied.) has not been listed previously for the vice-county and a small dark-faced hover fly, *Syrphus arcticus* Ztt. with *Pegomyia nigritarsis* (Ztt.) and *Lonchoptera furcata* (Fall.) were also additions to the list for V.C. 62.

At Pilmoor and at Gormire *Prionocera turcica* (Fab.) (*T. diana* Mg.) was fairly plentiful with odd specimens of *T. lateralis* Mg. and *Limnophila ochracea* (Mg.)

Here *Tabanus bisignatus* Jaen. and *Lasiopogon cinctus* (F.) were added to the list. At Gormire the capture of larvae of *Mochlonyx culiciformis* (Degeer) by Mr. Whitehead was the most interesting addition, another being *Ptychoptera contaminata* (L.) A pair of the uncommon species of *Helophilus*, *H. hybridus* Lw. were caught. Amongst the species of *Chilosia*, one, a small pale-haired specimen, was difficult to place, but Mr. J. E. Collin kindly points out that it is an abnormal *C. antiqua* Mg. (*sparsa* of Wingate) and is like specimens taken by Dr. Fordham at Fyling Hall and cited in the *Entomologists' Monthly Magazine*, 1931, p. 159. The species normally has long dark and short pale hairs, but in this variety the hairs are all pale. Others were *C. fraterna* Mg. and *C. intonsa* Lw.

Amongst species previously caught in the V.C. but uncommon are *Parallelomma albipes* (Fln.), *Ascia podagrica* (F.) and *Syrphus venustus* Mg., whilst at Pilmoor we were not allowed to forget the mosquito *Aedes punctor* Kirby.

In all 10 species were added to the vice-county list.

LEPIDOPTERA (Joyce Payne): The weather could not have been better for the butterflies and moths. Each day brought new finds and the sight of three of Yorkshire's less common butterflies, the Green Hairstreak, Pearl-bordered Fritillary and the Dingy Skipper was very pleasing. The Argent and Sable moth seems not to have been found commonly in Yorkshire of recent years so this species is perhaps our best find.

Ten to fifteen blue butterflies were seen flying round the tops of flowering Holly bushes at Sutton-under-Whitstonecliff. They were flying at a height of about 20 feet and were watched for about a quarter of an hour but none were taken. The caterpillars of *Erannis defoliaria* (Clerck) were very abundant and were responsible for most of the damage to birch leaves at Pilmoor.

#### BUTTERFLIES.

The Wall.	<i>Dira megera</i> (L.).	One taken near Felixkirk.
Small Heath.	<i>Coenonympha pamphilus</i> (L.).	Very few seen.
Pearl-bordered Fritillary.	<i>Argynnis euphrosyne</i> (L.).	Gurtof Gill. Hesketh. Sessay Wood. Common on the slopes near Little Gormire.
Small Tortoiseshell.	<i>Aglais urticae</i> (L.).	A few seen in very bad condition.
Peacock.	<i>Nymphalis io</i> (L.).	One seen at Gormire.
Small Copper.	<i>Lycaena phlaeas</i> (L.).	Plentiful at Pilmoor. Gormire. Near Felixkirk.
Green Hairstreak.	<i>Callophrys rubi</i> (L.).	Gurtof Gill. Very plentiful in the State Forest. One taken at Pilmoor. Plentiful at Gormire.
Large White.	<i>Pieris brassicae</i> (L.).	Common.
Small White.	<i>Pieris rapae</i> (L.).	Common.
Green-veined White.	<i>Pieris napi</i> (L.).	Common.
Orange Tip.	<i>Euchloë cardamines</i> (L.).	Frequent.
Brimstone.	<i>Gonepteryx rhamni</i> (L.).	A few seen at Gurtof Gill. One taken.
Dingy Skipper.	<i>Erynnis tages</i> (L.).	Several taken on the grassy slope at Hesketh. Plentiful at Pilmoor and in a rough pasture near Felixkirk.

#### MOths.

Cinnabar.	<i>Hypocrita jacobaeae</i> (L.).	About a dozen seen at Pilmoor.
Ruby Tiger.	<i>Phragmatobia fuliginosa</i> (L.).	One at Gormire.

Small Yellow Underwing.	<i>Panemeria tenebrata</i> (Scop.).	Common on roadside between Thirsk and Felix-kirk.
Mother Shipton.	<i>Euclidimera mi</i> (Clerck).	A few in heathy places.
Burnet Companion.	<i>Ectypa glyphica</i> (L.).	One at Pilmoor.
Argent and Sable.	<i>Eulype hastata</i> (L.).	A fair number flying at Pilmoor. Three taken.
Heath.	<i>Ematurga atomaria</i> (L.).	Very common in heathy places.
Brown Silver Line.	<i>Lithina chlorosata</i> (Scop.).	Very common among bracken.
Buff Tip.	<i>Phalera bucephala</i> (L.).	One reported at Gormire.
Pebble Hook Tip.	<i>Drepana falcataria</i> (L.).	Three taken at Pilmoor. One at Gormire.
Long-horned Moth.	<i>Adela reaumurella</i> (L.).	'Swarms' flying round oak and birch trees. Gurtof Gill. Gormire.

Nomenclature : *A Check List of British Insects*, Kloet & Hincks, 1945.

### Plant Galls (H. J. Burkill) :

- Acer pseudo-platanus* Linn.—*Eriophyes macrorrhynchus* Nal. Pilmoor.  
*E. macrochelus* var. *erinea*. Pilmoor.  
*Pyrus aucuparia* Ehrh.—*E. pyri* Pagenst. Lunshaw Beck and Gormire.  
*Crataegus monogyna* Jacq.—*Aphis* sp. Lunshaw Beck and Gormire.  
*Viburnum opulus* Linn.—*Aphis viburni* Scop. Sessay Wood.  
*Prunella vulgaris* Linn.—Nematodes found galling the leaves by Miss Rob. Gormire. I have not been able to trace any record of this gall. It may be a new host plant.  
*Rumex acetosella* Linn.—*Apion* sp. Pilmoor.  
*Betula alba* Linn.—*Eriophyes rudis* Canest. Lunshaw Beck, Sessay Wood and Gormire.  
*Corylus avellana* Linn. *Eriophyes avellanae* Nal. Lunshaw Beck.  
*Quercus Robur* Linn.—*Andricus ramuli* (Linn.) near Gormire.  
*A. quadrilineatus* Htg. Lunshaw Beck and Pilmoor.  
*Neuroterus aprilinus* (Gir.) Lunshaw Beck and Pilmoor.  
*N. schlechtendali* Mayr. Pilmoor.  
*N. verrucosa* Schl. Lunshaw Beck. Many on one tree.  
*Dryophanta divisa* (Htg.)—Lunshaw Beck.  
*Biorhiza pallida* (Oliv.) Lunshaw Beck and Gormire. Plentiful.  
*B. pallida* form *aptera* Bosc. Gormire.  
*Trigonaspis magaptera* (Panz.) Lunshaw Beck.  
*Salix alba* Linn.—*Rhabdophaga rosaria* (H. Low.) Pilmoor.  
*S. atro-cinerea* Brot.—*R. salicis* (Schr.) Pilmoor.  
*S. aurita* × *cinerea* A. Kern.—*R. salicis* (Schr.) Pilmoor.  
*Eriophyes tetanothrix* Nal. Pilmoor.

**Freshwater Biology** (H. Whitehead) : The excursion to Boltby on Saturday, May 15th, gave an opportunity of exploring the stream in Gurtof Gill as far up as Gurtof Wood. The stream bed is stony, with moss on some of the stones, offering good shelter to submerged larvae and nymphs. The stream banks are well wooded, a condition favourable to aquatic insects in the winged condition. There was very little filamentous algae. Near the fork of the stream were boggy patches with *Sphagnum*, from which slightly acid water seeped into the beck.

Few insects were on the wing, chiefly Stoneflies—*Leuctra nigra* (Oliv.), *L. hippopus* (Kemp.), *Protonemura meyeri* (Pict.) and *Nemoura cambrica* (Steph.). In addition, fully-developed nymphs of *Isoptera grammatica* (Poda), *Brachyptera risi* (Mort.), *Amphinemura cinerea* (Oliv.) were taken from under submerged stones.

Only one Caddis imago (*Philopotamus montanus* Don.) was seen. Larvae of *Hydropsyche* and *Rhyacophila* were fairly common.

There were no winged Mayflies but in the lower part of Gurtof Beck were many fully-developed nymphs of *Rhithrogena semicolorata* (Curt.) and *Ecdyonurus venosus* (Fabr.).

Several larvae and one pupa case of a species of *Simulium* were found.

On the 16th a visit was paid to Pilmoor : the morning was spent in investigating the large pool. This was rich in vegetation but difficult of access owing to a belt of marshy ground. Sweeps with the water-net yielded two species of leech, the Horse-leech (*Haemopsis sanguisuga* L.) and *Herpobdella atomaria* Caren. Larvae and pupae of the Gnat, *Culex*, were plentiful. Of the Crustacea, the Water Slater (*Asellus aquaticus* L.) and the 'Water Flea' *Simnocephalus exspinosus* (Koch.) were taken.

After lunch a visit was paid to the brick pond behind the church. Ivy-leaved Duckweed (*Lemna trisulca* L.) was abundant near the margin and *Potamogeton* in the deeper part. In this pond netting was supplemented by dragging and resulted in a haul of water plants with several beetles and immature specimens of the Water Bugs *Corixa* and *Notonecta*. The last throw failed to land a good-sized pram, and the business end of the drag !

A large pond to the east of the railway was covered with *Potamogeton*, amongst which were found several specimens of the Caddis-worm *Triaenodes bicolor* (Curt.), the only Caddis larva in this country which can swim and not merely crawl. Specimens of the common and widely distributed *Simnocephalus vetulus* (O.F.M.) were taken, all females bearing either eggs or young in the brood pouch.

Perhaps the most interesting find of the afternoon was in a small isolated pool surrounded by trees. The water was thickly populated with *Daphnia* and with the larvae and pupae of a midge. The latter were taken home and the emerged winged insects sent to Mr. Cheetham, who identified them as *Mochlonyx culiciformis* (Degeer). This fly has several characters intermediate between the Gnat *Culex* and a midge *Chaoborus*, whose almost transparent larvae are well known to pond hunters as the 'Phantom larvae.'

Little Gormire, a pool to the south-west of Lake Gormire, has a rich vegetation. The Alder-fly, *Sialis lutaria* (L.) was common. Mr. Mattinson handed me a fine specimen of the Water Scorpion *Nepa cinerea* L. In the water-net were found *Corixa* sp. (immature), Mayfly nymphs (*Cloeon* sp.) and several larvae of a beetle (*Acilius*) whose long first thoracic segment, in addition to the relatively large mandibles give a fierce appearance.

The marshy vegetation at the north end of Lake Gormire proved to be a good hunting ground for aquatic insects in the winged stage. A handsome Caddis, *Phryganea striata* L. was taken by Mr. K. G. Payne. A large number of males of the Mayfly, *Leptophlebia marginata* (L.) were swarming and 'dancing' in bright sunshine. *Cloeon dipterum* (L.) was taken on the wing and also the small Stonefly, *Nemoura variegata* Oliv.

The water of the lake was quite clear, but nevertheless yielded a rich supply of minute floating organisms. These were chiefly algae, an account of which is given by Miss Scott. The floating animal life (zoo-plankton) was varied in character and only a general indication of its constituents can be given. In point of numbers the Rotifers had the lead. More conspicuous by their size were the small Crustacea, Copepods and a few Cladocera. A few specimens were taken of larvae of a tiny midge (*Corynoneura*) furnished with comparatively long jointed antennae.

I am indebted to Mr. J. M. Brown for examining the aquatic Hemiptera, and to Mr. C. A. Cheetham for determination of the *Mochlonyx*.

### MALHAM, June 5th

THE fine weather following the Whitsuntide meeting gave way to rain during the week prior to our meeting. We were very fortunate to have the day fine though the wind kept insects from the open moorland, and only in sheltered corners such as Jennets Cove and Malham Cove was it profitable to use the nets. However, most entomologists seemed to choose the invigorating walk rather than the collecting grounds and little was reported after tea. The heavy rain of the previous week had added four inches of water to the Tarn and as the wet weather recommenced on the Sunday we were fortunate to have so fine a day. The large attendance of over 60 was evidence of the attraction of Malham to naturalists, and our hostess fortunately proved equal to the heavy task of entertaining the unexpected number.



On arriving at the foot of the falls in Gordale, the steep climb with the added extra rush of water very quickly sorted out the goats from the sheep, some of the latter re-taking the road to join the second party at the Cove, others climbing the steep hillside and returning to the stream side above the falls. It was a pleasure to meet Mr. W. Munn Rankin, who was associated with Dr. W. G. Smith in the pioneer work on plant ecology in Yorkshire, and we were glad to have our President, Mr. W. B. Alexander, with us on the excursion and to preside over the meeting.

**Flowering Plants** (W. A. Sledge): A considerable number of the species listed in the circular were seen by different members in the course of the excursion, but the party became so scattered that the plants mentioned below do not represent more than a few of the more interesting ones observed. I did not get as far as the Tarn or Tarn Moss and those who did will no doubt be able to add several names to the list. Mr. Thompson reported having seen *Saxifraga granulata* L. there and a little Cloudberry on Tarn Moss. At Gordale Scar the best plants were *Thalictrum montanum* Wallr., *Draba muralis* L. (also seen at Malham Cove), and the very small colony of *Carex capillaris* L. A plant of *Polemonium caeruleum* L., which was seen in plenty by those who visited the Cove, was also found on the rocks above Gordale. *Hippocrepis comosa* L. was also observed in several places on limestone rocks, and the moors between the head of Gordale and Great Close Mire yielded *Viola lutea* Huds., *Polygala amara* L., *Primula farinosa* L., *Carex dioica* L. and *Selaginella selaginoides* (L.) Link. *Bartsia alpina* L. was already in flower along with *Antennaria dioica* (L.) Gaertn. in its well-known station. Other plants seen include *Actaea spicata* L., *Thlaspi alpestre* L., *Cochlearia alpina* Wats., *Galium pumilum* Murr. (*G. sylvestre* Poll.) and *Asplenium viride* Huds.

**Bryology** (H. Walsh): The bryology records for the Malham area in the Yorkshire register give for the mosses, exclusive of Sphagna, about 100 species and 22 hepatics. One's impressions of the area covered by this meeting were that these figures were fairly representative. On the dry limestone walls and boulders *Madotheca platyphylla* (L.) Dum. and *Plagiochila asplenioides* (L.) Dum. were the only hepatics seen. These two seem well able to compete with the mosses and were both plentiful and well distributed. Few other leafy hepatics were seen. *Calypogeia Trichomanis* (L.) Corda and *Diplophyllum albicans* (L.) Dum. were collected near the Tarn and *Lophocolea bidentata* (L.) Dum. at the Cove. Of the thalloids, *Reboulia hemisphaerica* (L.) Raddi was seen in quantity when ascending the Scar and *Conocephalum conicum* (L.) Dum. at the Scar base, where *Metzgeria furcata* (L.) Dum. grew among mosses on the cliff face. A small patch of *Marchantia polymorpha* L. was seen by the stream at the Cove and occurred in quantity on a garden path behind the meeting room with *Lunularia cruciata* (L.) Dum. Cliffs by the stream at Jennets Foss supported a free growth of *Metzgeria pubescens* (Schrank) Raddi.

The mosses collected from the dry limestone boulders and walls included *Camptothecium sericeum* Kindb., *Hypnum molluscum* Hedw., and *H. cupressiforme* L. in profusion, with *Neckera crispa* Hedw., *N. complanata* Huebn., *Tortula intermedia* Berk., *T. muralis* Hedw., *Encalypta streptocarpa* Hedw., *Anomodon viticulosus* H. & T., *Grimmia apocarpa* Hedw., *G. pulvinata* Smith, *Bryum capillare* L. and *Barbula unguiculata* Hedw. *Orthotrichum anomalum* Hedw. var. *saxatile* Milde was seen occasionally, and *Trichostomum tortuosum* Dixon occurred more on boulders and cliffs than on walls. Grassy banks by the roadside yielded *Hylocomium squarrosus* B. & S. and *Thuidium tamariscinum* B. & S. From the pastures above the Scar and Cove *Polytrichum gracile* Dicks. and a non-falcate form of *Dicranum scoparium* Hedw., probably var. *spadiceum* Boul., were collected, and very scattered small clumps of *Rhacomitrium lanuginosum* Brid. and *Polytrichum juniperinum* Willd. were seen. The time spent at the Scar only allowed for the collection of a few in what appeared to be a good area. One of the mosses collected here was sent to Mr. J. B. Duncan and proved to be *Eurhynchium Teesdalei* Schp. Others were *Eurhynchium tenellum* Milde, *E. Swartzii* Hobk., *Hypnum commutatum* Hedw., *Amblystegium filicinum* De Not., *Weisia curvirostris* C.M., *Mnium serratum* Schrad. and *M. rostratum* Schrad. The marshy area near the Tarn yielded *Splachnum sphaericum* Linn. fil., *Hypnum scorpioides* L., *Brachythecium purum* Dixon, and *Cinclidotus fontinaloides* P. Beauv. A large patch of *Dicranella varia* Schp. was seen on the low-lying soil

near the Cove and *Funaria hygrometrica* Sibth. on the site of camp fires. From the base of a tree I collected *Dicranoweisia cirrata* Lindb., devoid of capsules, the presence of which is usually a marked feature. The stems on examination showed numerous gemmae at the axils of the upper leaves, and this was seen to be a general feature of the numerous stems. The presence of gemmae in this species is rarely referred to in moss books and Dixon's *Handbook* has no reference to them. Mosses seen by other members and not mentioned above are *Hypnum falcatum* Brid. var. *virescens* Schp., *H. stellatum* Schreb., *Camptothecium nitens* Schp., *Orthothecium rufescens* B. & S., *Dicranum Bonjeani* De Not., *Philonotis calcarea* Schp., *Brachythecium rivulare* B. & S., *Eurhynchium murale* Milde, *Amblystegium fluviatile* B. & S., and *Cinclidium stygium* Swartz.

**Fungi** (W. G. Bramley) : The excursion was the recorder's first visit to the area and the fungi were to some extent neglected for the topography and scenery. One or two common dung agarics were in evidence and a single mushroom was found by one of the party. It was rather surprising to find *Peronospora schleideni* Unger. infecting Garlic on the limestone pavement above Gordale Scar some 1,100 ft. O.D.

The following are the more interesting of the records :

\* Not in Mason & Grainger. † Not in M. & G. for V.C. 64.

† *Tapesia fusca* (Pers.) Fckl.

*Heterosphaeria patella* (Tode) Grev.

† *Lophodermium arundinaceum* (Schrad.) Chev., on *Phragmites*.

† *Ophiobolus acuminatus* (Sow.) Duby, on thistles.

*O. rubellus* (Pers.) Sacc. (= *Porphyrogenus*), on thistles and Umbellifer stems.

† *Pseudovalsa lanciformis* (Fr.) Ces. & de Not., on *Betula*.

\* *Myxosporium diplodiodes* Allersch., on *Pyrus aucuparia*.

**Ornithology** (R. M. Garnett) : A list of 52 species compiled from the notes of several observers bears out the remark printed in the circular that 'the district provides suitable habitats for many types of birds,' though some expected species, e.g. Grey Wagtail and Kestrel, failed to put in an appearance, and the Tawny Owl was the only bird of prey recorded. Nor was any species of game bird seen, not even the Red Grouse. Common Redstarts were breeding near the Tarn and at the Cove, feeding fledged young at the latter, and here House Martins were busy collecting mud from a wet path near the stream for nests in various stages of construction against the lower part of the face of the cliff. Seventeen were counted. Sand Martins were breeding in holes made in peat 'hags' fringing a part of the Tarn. Near Tarn House a Wood Pigeon and a Chaffinch had built nests in the same Yew tree only a foot or so apart. Other breeding species noted were Jackdaw, Pied Wagtail, Great Tit, Wheatear, Swift, Common Snipe, Common Sandpiper and Lapwing, and to these many of the following species (of which one or more birds were seen) could have been added had time been available : Carrion Crow, Rook, Starling, Greenfinch, Reed Bunting, House Sparrow, Skylark, Meadow Pipit, Yellow Wagtail, Blue Tit, Marsh Tit, Spotted Flycatcher, Willow and Wood Warblers, Mistle and Song Thrushes, Ring Ousel and Blackbird, Robin, Hedge Sparrow, Wren, Dipper, Swallow, Cuckoo, Mute Swan, Mallard, Teal, Tufted Duck, Great Crested and Little Grebes, Curlew, Dunlin, Redshank, Golden Plover, Black-headed and Lesser Black-backed Gull, Moorhen and Coot.

**Mollusca** (J. H. Lumb) : Malham is a particularly good district for Mollusca, and in past years has been well investigated by the Bradford Naturalists.

On the ground covered, I made note of or collected the following, though this list by no means exhausts the species to be found at Malham.

<i>Helix arbustorum</i> L.	<i>Pyramidula rotundata</i> Müll.	<i>Limnea stagnalis</i> L.
<i>H. nemoralis</i> L.	<i>Helicigona lapicida</i> L.	<i>L. peregra</i> Müll.
<i>H. hortensis</i> Müll.	<i>Ena obscura</i> Müll.	<i>Succinea elegans</i> Risso.
<i>Hyalinia cellaria</i> Müll.	<i>Helicella itala</i> L.	<i>Sphaerium corneum</i> L.
<i>Vitrea alliaria</i> Miller.	<i>Clausilia bidentata</i> Ström.	<i>Ancylus fluviatilis</i> L.
<i>V. pura</i> Alder.	<i>C. cravenensis</i> Taylor.	<i>Arion ater</i> L.
<i>Vitrina pellucida</i> Studer.	<i>Vertigo antiuertigo</i> Drap.	<i>Agriolimax agrestis</i> L.
<i>Hygroma rufescens</i> Penn.	<i>Balea perversa</i> L.	<i>A. laevis</i> Müll.

## BALNE PONDS AND WHITLEY BRIDGE, June 19th

THE Balne meeting unfortunately came during a period of unsettled showery weather. This reduced the attendance and only eleven societies responded to the roll call. Before lunch it was reasonably fine and a visit to Whitley Thorpe gravel pits proved interesting to botanists and we saw plants in plenty that were welcome strangers to our vasculums and also plants we had seen occasionally, but not in such quantity. In one place the gravel had been removed down to a clay base and where the water accumulated marsh plants like the Bulrush occurred. Amongst the vegetation and sand a moss was in plenty, apparently *Ceratodon purpureus* Brid., but it had distinctly pointed leaves due to the excurrent nerves. This would have placed it under *C. conicus* Lindb., but the fruit had the normal capsule with the strumose base of *C. purpureus* Brid.

When the party assembled at the ponds we had an hour of fine weather and saw an astonishing number of the smaller Dragonflies, mostly *Agrion puella* L. and a few *Pyrrhosoma nymphula* Sulz. Several larger specimens were seen, but they were not caught. Unfortunately a shower came and damped the vegetation, stopping sweeping by the entomologists. The party then got split up, some making for the Heck gravel pits, others taking shelter until another short fine spell came, but this was the last, and more wet sent us in for an early tea. In the absence of our President or Vice-Presidents, Mr. W. G. Bramley was voted into the chair. Reports were presented, and votes of thanks were carried to Mr. Grimshaw for permission to visit the ponds and to our Divisional Secretary, Miss J. Grainger, who overcame a host of obstacles in arranging the meeting.

**Flowering Plants** (W. A. Sledge): This excursion proved an unusually interesting one botanically, as it provided in close proximity two very different floras both of which included several species of infrequent occurrence in the county. The sand and gravel pits about Whitley Thorpe and Heck contained many interesting arenicolous species whilst in and around the pond on Balne Moor there is an unusually rich assemblage of marsh and aquatic species. *Carex Pseudo-cyperus* L. is here the most abundant of the larger marsh plants, much exceeding in quantity the Reed Maces of which both *Typha latifolia* L. and *T. angustifolia* L. are present. The other less common species seen here were *Samolus Valerandi* L., *Baldellia (Alisma) ranunculoides* (L.) Parl., *Potamogeton coloratus* Hornem., and *Chara hispida* L. Later in the year *Oenanthe Lachenalii* C. C. Gmel. is frequent, but it was not observed on this occasion. The contrast between the two sections of the pond, which is divided diagonally by a railway embankment, is very striking. The eastern half is dominated by an almost pure community of *Equisetum limosum* L. and lacks all the more interesting species, and indeed many of the common marsh plants which characterise the western half.

The sand pits at Whitley Thorpe contain much *Ornithopus perpusillus* L. and *Anthemis arvensis* L., with *Anthriscus vulgaris* Pers., *Senecio sylvaticus* L. and *Vulpia (Festuca) bromoides* (L.) S. F. Gray, and other common plants of dry sandy ground. One pit provided the best find of the day in a colony of *Geranium rotundifolium* L. This is an addition to the Yorkshire flora, though its status here is uncertain.

The extensive pits between Heck and Hensall contained in addition to some of those already seen at Whitley Thorpe, *Spergularia rubra* (L.) J. & C. Presl., *Malva moschata* L., *Trifolium arvense* L., *Vicia hirsuta* (L.) S. F. Gray, *V. angustifolia* L., *Jasione montana* L., and *Lamium hybridum* Vill. On the roadside bank before entering these pits *Plantago Coronopus* L. and *Carex Pairaei* F. Schultz were gathered and about near-by farm buildings there was a good growth of *Malva neglecta* Wallr. (*M. rotundifolia* auct.).

**Bryology**: Mrs. Appleyard reported that *Hypnum giganteum* Schp. and *H. cordifolium* Hedw., as mentioned in the circular, were both plentiful. Two other species not easily identified in the field proved to be *Hypnum scorpioides* L. and *Bryum pseudo-triquetrum* Schwaeg. The first was a floating growth looking like a harpidioid *Hypnum* and very different in appearance to normal *H. scorpioides*. The water level had evidently been raised considerably and had affected the growth of this and caused the *Bryum* to push up tall fresh shoots which gave it an uncharacteristic appearance.



**Fungi** (W. G. Bramley) : Little was to be expected in the way of fungi except Uredines and perhaps a few Pyrenomycetes and moulds. Rain made the search for the latter more or less hopeless, though the material examined seemed to be fairly free from saprophytes.

\*Not in Mason & Grainger for V.C. 63. W.=Quarry at Whitley Thorpe.

*Peronospora effusa* (Grev.) Raben., on *Chenopodium*.

*Pleospora herbarum* (Fr.) Raben., on *Artemisia*, W.

\**Didymella tosta* B. & Br., on *Epilobium angustifolium*.

*Ustilago kuhneana* Wolff., on *Rumex acetosa*.

\**U. perennans* Rost., on *Arrhenatherum*.

*U. tragopogonis-pratensis* (Pers.) Wint.

*U. violacea* (Pers.) Tul., common on *Lamium album*, W.

\**Puccinia arrhenatheri* Erikss., II on *A. elatior*.

\**P. carduorum* Jacky., II, III on *C. nutans*, W.

*P. graminis* Pers., old III on *Agropyron repens*, W.

*P. hieracii* Mart., II on *H. murorum*.

*P. hypochaeridis* Oud., II, III, on *H. radicata*.

*P. tragopogi* (Pers.) Cda., I.

**Ornithology** : Mr. P. A. Humble reported that 22 species were seen, these being : Rook, Magpie, Cuckoo, Greenfinch, Chaffinch, House Martin (common), Sand Martin (common), Swallow (common), Swift, Lapwing (three only), Common Whitethroat (common), Dunnock, Skylark, Willow Warbler, Meadow Pipit, Moorhen, Partridge, Woodpigeon, Turtledove, Reed Bunting, Corn Bunting, and Yellow Bunting.

**Diptera** (C. A. Cheetham) : The most plentiful Crane fly on the pond was *Prionocera turcica* (Fab.) (*Tipula diana* in Wingate), and it appears only to need the use of the net on marshy ponds to extend the known range of this species. The other species of *Tipula* with it was *T. montium* Egg. Another smaller genus of crane fly (*Ramphidia* in Wingate) was in fair quantity. The genus is now known as *Helius* and it is easily known by its long rostrum which has the palps at the end. *H. longirostris* (Mg.) was plentiful and *H. pallirostris* Edw. was an addition to the Yorkshire Diptera list ; so was a still smaller insect *Molophilus pleuralis* de Meij. The medium-sized black *Ptychoptera contaminata* (L.) was also on the edges of the pool and a large yellow *Tipula lunata* L. (*T. ochracea* Mg. in Wingate) was taken on the roadside hedge with the large hover-fly *Volucella bombylans* (L.), *Lonchaea chorea* (Fab.) and a *Pollenia rudis* (Fab.) which had pale or white hair in place of the normal golden tufts.

**Lepidoptera** (Joyce Payne) : During the short fine spell in the afternoon the following species were seen on the grass verges near the ponds :

Silver Ground Carpet, *Xanthorhoe montanata* (Sch.).

Chimney Sweeper. *Odezia atrata* (L.).

Common Blue. *Polyommatus icarus* (von Rott.).

Large White. *Pieris brassicae* (L.).

Small White. *P. rapae* (L.).

Large Skipper. *Argades sylvanus* (Esp.).

Foester. *Procris statice* (L.).

Mother Shipton. *Euclidimera mi* (Clerck).

Earlier in the day at Whitley Thorpe Quarry were seen :

Meadow Brown. *Maniola jurtina* (L.).

Silver Y. *Plusia gamma* (L.).

On the river bank at Beal a Wall *Diva megera* (L.) was seen. Nomenclature from *A Check List of British Insects*, Kloet and Hincks.

**Coleoptera** : Mr. W. Silkinson sends the following list of beetles taken at the pond :

*Rhynchites germanicus* Hbst.

*Donacia thalassina* Germ. (common).

*Tropiphorus tomentosus* (Marsh.).

*Gastrophysa polygoni* (Linn.).

*Apion curtirostre* Germ.

*Rhagozycha limbata* Thom.

*Gyrinus marinus* Gyll.

*Malachius bipustulatus* (Linn.) (common).

*Plateumaris sericea* (Linn.) (common).



## GRISTHORPE BAY, July 3rd

GRISTHORPE BAY is almost unknown ground to naturalists other than geologists. There is a reason for this lack of knowledge in the difficulty of making arrangements for parties to visit the place. Fortunately for us, Mr. G. B. Walsh undertook the troublesome task which at times appeared hopeless and he well earned the thanks voted to him at the meeting at the close of the day when he acted as Chairman.

The Geological Sub-Committee of the Nature Reserves Investigation Committee proposed Gristhorpe, including Yons Nab and Castle Rocks, with the important fossil plant beds in the Middle Estuarine series, as a Conservation area, and this was accepted in the Wild Life Conservation Committee's Report. At our meeting botanists outnumbered geologists. The latter had known the exposure previously, but to the botanists the amount and state of the fossil plant material was a revelation. Dr. H. Hamshaw Thomas said in his Presidential Address (*The Naturalist*, 1939, pp. 43-51), 'Continuous collecting always provides some new forms and members of the Union should continue the quest of the Primitive Flower in these Jurassic rocks.' This should be remembered by botanists.

**Flowering Plants** (Miss M. Hyde) : Of the plants mentioned in the circular, *Anthyllis vulneraria* L., *Daucus carota* L., *Pulicaria dysenterica* (L.) Gaertn., *Plantago maritima* L., *Anacamptis pyramidalis* (L.) Rich., *Triglochin palustre* L., *Phragmites communis* Trim. were seen. Only one patch of *Triglochin palustre* was found, on a wet part of the cliff; and in a similar wet region on the south cliff of Cayton Bay *Juncus squarrosus* L., *J. conglomeratus* L., *Eriophorum angustifolium* Honck. and *Hydrocotyle vulgaris* L. were found.

Most of the cliff surface of Gristhorpe Bay was very dry, and fairly recent falls of cliff had left areas which were only partly covered by vegetation. *Linum catharticum* L., *Heracleum sphondylium* L., *Tussilago farfara* L., *Hieracium pilosella* L., *Sonchus asper* (L.) Hill, *Plantago lanceolata* L., *Dactylis glomerata* L. were among the plants seen on these dry cliffs.

**Bryophyta** (C. A. Cheetham) : Whilst collecting flies on the cliff any mosses seen were gathered. There was plenty of *Hypnum molluscum* Hedw., *Brachythecium purum* Dixon and *B. glareosum* B. & S.; rather less *Hylocomium triquetrum* B. & S., *Hypnum cuspidatum* L., *Amblystegium filicinum* De Not., *Brachythecium rutabulum* B. & S., and *Ceratodon purpureus* Brid., with odd patches of *Hypnum stellatum* Schreb., *Bryum pseudo-triquetrum* Schaeg., *Trichostomum mutabile* Bruch., *Weisia viridula* Hedw., *Webera albicans* Schp. and *Fissidens taxifolius* Hedw. The abundance of *Hypnum molluscum* was evidence of a calcareous soil which one had not expected and the absence from the gatherings of *H. cupressiforme* seemed strange.

**Marine Algae** (Miss D. Perkins) : The following seaweeds were collected at Gristhorpe Bay :

<i>Ulva lactuca</i> var. <i>latissima</i> DC. (common).	<i>Fucus vesiculosus</i> Linn. (abundant).
<i>Enteromorpha compressa</i> Grev. (common).	<i>F. serratus</i> Linn.
<i>E. intestinalis</i> Link.	<i>Ectocarpus tomentosus</i> Lyngb.
<i>Cladophora rupestris</i> Kutz.	<i>Pilayella littoralis</i> Bory.
<i>Pelvetia canaliculata</i> Dene. & Thur.	<i>Ceramium rubrum</i> var. <i>pedicellatum</i> J. G. Agardh.
<i>Ascophyllum nodosum</i> Le Jol. (abundant).	<i>Polysiphonia fastigiata</i> Grev. on <i>A. nodosum</i> .

Since the tide was fairly high only the above species were actually found growing. The following, however, were noted among the drift :

<i>Codium tomentosum</i> Stack.	<i>Ectocarpus terminalis</i> Kutz. on stipes of <i>L. digitata</i> .
<i>Laminaria digitata</i> Lamour. (very common).	<i>Elachistea flaccida</i> Aresch. on <i>H. siliquosa</i> .
<i>L. saccharina</i> Lamour. (common).	<i>Porphyræ umbiliculis</i> J. G. Agardh.
<i>Himanthalia lorea</i> Lyngb.	<i>Corallina officinalis</i> Linn. (common).
<i>Halidrys siliquosa</i> Lyngb. (common).	<i>Polysiphonia nigrescens</i> Grev.
<i>H. siliquosa</i> var. <i>siliculosus</i> .	

*Laurencia pinnatifida* Lamour.  
*Chondrus crispus* Lyngb. (common).  
*Gigartina stellata* Patt.  
*Delesseria sanguinea* Lamour. (common).

*Membranopteris alata* Grev. on stipes of  
*L. digitata*.  
*Rhodymenia palmata* Grev.  
*Plocamium coccineum* Lyngb.  
*Psilota plumosa* G. A. Agardh.

**Ornithology** (Miss Ealing): Gristhorpe Bay is not an area likely to be inhabited by many species of birds even at a more favourable season such as spring or autumn. There are no high rocky cliffs providing nesting sites for sea birds nor is there much cover for the land birds.

The following birds were recorded during the outing: Blackbird, Thrush, Hedge Sparrow, Yellowhammer, Skylark, Rock Pipit, House Martin, Blue Tit, Great Tit, Chaffinch, Jackdaw. On the shore and rocks just off shore, Herring Gull and Black-backed Gull, mostly immature, were seen. On the small area of cliff face included in the bay, Fulmars were seen among the gulls, and also Kittiwakes, and a solitary Tern flew away round the corner of the bay before it could be identified. The most interesting episode of the afternoon was the rescue of a Red-legged Partridge, which was fluttering in the sea about six feet out. The bird was seen by Rev. T. B. Kitchen, who waded out and rescued it, and it speedily recovered from its immersion and was left in a grassy hollow well above the shore.

**Diptera** (C. A. Cheetham): Amongst the masses of dead seaweed were many two-winged flies, one of which, *Ceratinostoma ostiorum* (Hal.) has not been previously recorded in the county, and *Scatophaga litorea* Flin. was an addition to V.C. 62. A third species here was *Coelopa frigida* (Fab.)

On the grassy portion of the cliffs, in hollows out of the strong wind, a fair number of insects were swept up and one very small Dolichopod, *Schoenophilus versutus* (Wlk.) was plentiful and is an addition to the county list. *Hylemyia pullula* Ztt. was in considerable numbers and the large handsome *Chilosia illustrata* (Harr.) attracted attention as did *Catabomba pyrastris* (L.) and *Volucella bombylans* (L.) Other interesting species were *Syrphus lasiophthalmus* Ztt., *Chrysopilus cristatus* (Fab.), *Beris geniculata* Curt., *Trypetoptera punctulata* (Scop.), *Lonchea chorea* (F.) and *Dolichopus unguilatus* (L.)

**Lepidoptera** (T. Bailey): The following butterflies were common:

Large White *Pieris brassicae* (L.).  
 Small White *P. rapae* (L.).  
 Small Heath *Coenonympha pamphilus* (L.).

Other butterflies seen were:

Small Copper *Lycaena phlaeas* (L.).  
 Common Blue *Polyommatus icarus* (von Rott.).  
 Large Skipper *Ochlodes venata* (Brem. & Grey.).

Burnet Moth caterpillars and chrysalids were very common on the rough grass.

**Coleoptera** (G. B. Walsh): While Rev. T. B. Kitchen collected on the shore, the writer spent the whole of the afternoon searching at grass roots on the cliffs. Beetles were not common, but a few interesting species were found, including:

*Pseudophonus rufipes* (Deg.).  
*Nebria livida* (Linn.). Fairly common  
 under seaweed above high-water  
 mark. (T.B.K.)  
*Dromius linearis* (Oliv.).  
*Acrotichis intermedia* (Gillm.).  
*Micralymma marinum* (Stroem. H.).  
 (T.B.K.).  
*Tachyporus tersus* Er.  
*T. chrysomelinus* (Linn.).

*Tachyporus hypnorum* (Fabr.)  
*Corymbites cupreus* (Fabr.) and var.  
*aeruginosus* (Fabr.).  
*Coccinella 24-punctata* Linn.  
*Chrysolina staphylaea* (Linn.).  
*Derocrepis rufipes* (Linn.).  
*Apteropeda globosa* (Illig.).  
*Sitona sulcifrons* (Thunb.).  
*S. hispidulus* (Fabr.).

#### MYRIAPODA

*Julus terrestris* L.  
*J. pulchellus*.

*Julus albipes* Koch.

## GARSDALE HEAD, July 17th

THE last of the field meeting in 1948 was held at Garsdale Head, perhaps better known as Hawes Junction. The difficulty of finding accommodation at first made a meeting here seem almost hopeless and, to this, transport troubles were added, but the attendance proved that the Union can overcome such difficulties, whilst fortune provided a fine day in a distinctly wet period.

Along the Yore-side meadows towards Lunds Church the abundance of the Melancholy Thistle was a striking feature, as were clumps of the yellow *Mimulus* and the Wood Cranesbill. The small streams of Keld Gill and High Dyke cutting into the Yoredale rocks of Lunds Fell provided some striking ecological pictures. The highest ridge of limestone rocks had typical plants, Salad Burnet, Rockrose, Hairy Rock-cress and Blue grass (*Sesleria*). Then, lower down the hillside, we found grit cliffs with Foxglove, Heather, Bilberry and Hard Fern. These two cliffs and their waterfalls were only a very short distance apart. Some members were attracted further away to the border of Yorkshire at Hell Gill. Leyland, writing in 1540, says, 'There is a bek cawll'd Hell Gille because it runneth in such a deadly place.' Our members got some interesting plants, however, without coming to any harm.

Insects were very scarce owing to the cloudy sky and lack of sunshine.

Mr. Ralph Chislett presided at the meeting for reports and in place of a vote of thanks to landowners or Divisional Secretary, one was carried to the lady who had provided room and an excellent tea and made the meeting possible.

**Flowering Plants** (G. A. Shaw): The meadows at the time of the meeting were just at their best so far as wealth of flowers was concerned, and although perhaps nothing of great rarity was discovered, they presented a very colourful picture. The following list, made between the Moorcock Inn and the Westmorland border, while not exhaustive, contains common plants that would not normally be mentioned, but included because of the lack of records from this district. *Arabis hirsuta* (L.) Scop., *Cochlearia alpina* Wats., *Geranium sylvaticum* L., *Lathyrus montanus* Bernh., *Potentilla erecta* (L.) Rausch, *Filipendula ulmaria* (L.) Maxim., *Sedum villosum* L., *Conopodium majus* (Gouan) Lor. & Barr., *Galium mollugo* L. (confined to roadsides and railway banks), *Succisa pratensis* Moench, *Cirsium heterophyllum* (L.) Hill, *Gentiana campestris* L., *Mimulus guttatus* DC., *Euphrasia* spp., *Pedicularis sylvatica* L., *Stachys officinalis* (L.) Trev., *Polygonum viviparum* L., *P. bistorta* L., *Listera ovata* (L.) R.Br., *Orchis purpurella* T. & T.A. Steph. (seen in three localities only: on the Kirby Stephen roadside where the track to Lunds leaves it, in a wet pasture between Lunds and West End, and on the Hawes railway bank about two miles below the Moorcock), *O. Fuchsii* Druce, *Gymnadenia conopsea* (L.) R.Br., *Platanthera chlorantha* (Cust.) Rehb., *Triglochin palustris* L., *Carex rostrata* Stokes, *Botrychium lunaria* (L.) Sw., *Cystopteris fragilis* (L.) Bernh., *Equisetum sylvaticum* L., and *Lycopodium selago* L. (Ure Head). At Hell Gill *Draba incana* L., *Geranium lucidum* L., *Galium pumilum* Murr., and *Asplenium viride* Huds. were seen.

The riverside about a mile downstream from the Moorcock yielded, in addition to many of the above, *Hypericum hirsutum* L., *H. pulchrum* L., *Pimpinella saxifraga* L., *Primula farinosa* L., *Carex pallescens* L., *Polypodium vulgare* L., and again *Asplenium viride* Huds.

Grisedale, the valley between Baugh and Swarth Fells, had an abundance of *Polygonum viviparum* L., *Gymnadenia conopsea* (L.) R. Br., and *Platanthera chlorantha* (Cust.) Rehb. in the meadows near East House. The lower part of Grisedale, behind Clough Farm, seems the only possible locality for the *Draba muralis* L. mentioned in the circular, but although this was examined, none was seen.

The only Lady's Mantles identified were *Alchemilla glabra* Neyg. and *A. xanthochlora* Rothm., which were of general occurrence, although I have some small forms which require further study.

Although Ais Gill is a little on the wrong side of the boundary, a visit is well worth while if only to see the magnificent growth of the moss *Orthothecium rufescens* B. & S. on the dripping rock ledges, and the wealth of *Aquilegia* on the cliffs. Another very interesting plant, gathered just two miles beyond our boundary, was *Carex ornithopoda* Willd. on Fell End Clouds, Wild Boar Fell.



This locality is just beyond our boundary at Needlehouse Gill, and unfortunately the Yorkshire side does not seem to have a similar limestone outcrop which might harbour this sedge.

**Bryology** (Mrs. Appleyard) : As might be expected from the type of country, the mosses were interesting and varied.

*Polytrichum aloides* Hedw., *Dicranella heteromalla* Schp. and masses of *Pleuridium subulatum* Rabenh. in fruit grew along the banks of the Ure. *Dicranella squarrosa* Schp. occurred in several places and some *Dicranella Schreberi* Schp. On the higher limestone was *Trichostomum mutabile* Bruch., *T. crispulum* Bruch. in various forms, a little *T. tortuosum* Dixon, *Orthothecium intricatum* B. & S., and *Neckera crispa* Hedw. and *N. complanata* Huebn. sparingly. *Splachnum sphaericum* Linn. fil. was found near Hell Gill. Other mosses noted were *Polytrichum piliferum* Schreb., *Grimmia apocarpa* Hedw. var. *gracilis* W. & M., *Rhacomitrium aciculare* Brid. in young fruit, *R. canescens* Brid., *Weisia rupestris* C.M. in fruit, *Anoetangium compactum* Schwaeg., *Aulacomnium palustre* Schwaeg., *Bartramia pomiformis* Hedw. in fruit, *Philonotis fontana* Brid. and *Webera cruda* Schwaeg. in fruit, *Webera nutans* Hedw., *Plagiobryum Zierii* Lindb., *Bryum pseudo-triquetrum* Schwaeg., *Thuidium tamariscinum* B. & S., *Brachythecium rivulare* B. & S., *B. rutabulum* B. & S., *Hypnum molluscum* Hedw., *H. palustre* Huds. in fruit, *H. cuspidatum* L., *Hylocomium squarrosum* B. & S., and *Dicranella varia* Schp.

**Ornithology** (R. Chislett) : In mid-July, between the breeding and the migration seasons, with adult birds mainly quiet, and the young of most species on the wing—some of them already quietly moving away from their nesting areas—an upland landscape was hardly to be expected to show a long list of birds ; but it reached the respectable total of 40 species.

Above the high ground, Raven, Ring-Ousel, Kestrel, Buzzard and Lesser Black-backed Gull were noted. Lapwing, Snipe, Redshank and Curlew occurred about the marshy places, the latter obviously still with walking young ; but all were less noticeable than they were a month previously. By the streams Sandpipers still flitted, and Pied Wagtails, and one pair of Grey Wagtails, with Yellow Wagtails in the pastures hard by more numerous than either of their relatives, as is usual about the upper parts of the Dales.

The thin straggling belts of trees streaking the hillsides beside the rills that feed the infant Ure, showed family parties of Chaffinches, Lesser Redpolls, Great and Blue Tits, Spotted Flycatchers, Willow Warblers, and odd Robins, Hedge Sparrows, Wrens and Cuckoo (young on wing). Other species recorded were Jackdaw, Magpie, Reed Bunting, Meadow Pipit and Wheatears, both with young, Swallow, Martin, Sand Martin, Heron, Stock Dove, Black-headed Gull, Moorhen, Grouse and Partridge.

**Lepidoptera** (F. Hewson) : Butterflies were very few and in proportion with the amount of sunshine, but members reported Common Blue (*P. icarus* (von Rott.)), Small Copper (*L. phlaeas* (L.)), Small Heath (*C. pamphilus* (L.)), and one of the Whites (*Pieris* sp.)

Comparatively few larvae of the Small Tortoiseshell (*A. urticae* (L.)) were to be seen. Of moths a few Silver-ground Carpets (*X. montanata* (Schiff.)) and more Chimney Sweepers (*O. atrata* (L.)) were flying.

From fallows a number of larvae were beaten, one of the Puss Moth (*C. vinula* (L.)) one of the Iron Prominent Moth (*N. dromedarius* (L.)), and a good number of geometers.

**Diptera** (C. A. Cheetham) : Amongst the few Diptera were three additions to V.C. 65 : *Dolichopus urbanus* Mg., *Hilara curtisi* Coll. (*cilipes* Mg.), and *Pogonomyia brumalis* (Rond.) (*meadei* Pok.). In the little gritstone gorge mentioned above a solitary Daddy Longlegs was caught, a woodland species, *Tipula scripta* Mg. and in the shade of the waterfall there several spotted winged Craneflies were flying. These, *Dicranomyia didyma* (Mg.), had wings much darker than I have had previously and were like the type figured by Edwards as a very dark specimen. Other species caught were *Dolichopus unguiculatus* (L.), *Chrysopilus cristatus* (Fab.), *Tetanocera laevisfrons* Lw., *Helomyza laevisfrons* Lw., and *Coenosia means* Mg.



## BOOK REVIEWS

**Memoirs of the Geological Survey of Great Britain ; Dudley and Bridgnorth (Sheet 167),** by T. H. Whitehead and R. W. Pocock. Pp. 226 with 10 plates. H.M. Stationery Office, 7/6.

A long range of strata from the Wenlock to the Keuper, a wide variety of Pleistocene phenomena and occasional igneous rocks provide the material on which this valuable addition to the memoirs on Midland geology is based. The main economic interest lies naturally in the Coal Measures and the authors discuss the prospects of working coal in the areas concealed under Upper Coal Measures and Triassic rocks. Repetition of earth-movement is shown by the succession of unconformities and the time-honoured problem of the age of the Clent Group is still regarded as unsolved although the rocks are listed as 'Carboniferous?'. The area is approximately bisected by the marginal deposits of the Irish Sea Glacier but relics of an older drift occur to the south. Tentative correlations are made between the stages of retreat of the ice with those suggested by Wills for the Severn valley.

Among other problems discussed are the lower boundary of the Devonian, the origin of the Bunter pebbles and the emplacement of the Midland basalts.

The photographs are well chosen to illustrate the varied geology and the general standard of production of the memoir is high.

H. C. V.

**Memoirs of the Geological Survey of Great Britain : Geology of the Country around Barnsley,** by G. H. Mitchell, J. V. Stephens, C. E. N. Bromehead and D. A. Wray, with a contribution by R. Crookall. Pp. 182, with 33 text-figures and two plates. H.M. Stationery Office, 7/6.

This is the fourth instalment of the results of the re-survey of the Yorkshire Coalfield and follows very closely in its manner of presentation the earlier memoir on the Wakefield area. Naturally, the bulk of the memoir deals with the Coal measures of the South Yorkshire region of the coalfield. The succession of coals, sandstones, etc., is described in great detail and the regional variation in thickness and quality of these rocks is clearly demonstrated by a series of comparative vertical sections and isopachyte maps. The value of the three types of fossils—plants, fresh-water mollusca and marine mollusca—is discussed in Chapter V. The memoir is indispensable to all concerned with the economic wealth of this region and will undoubtedly stand as an invaluable work of reference for a long time.

The Permo-Triassic rocks of the area are noteworthy in being more fossiliferous than those to the north and full details are given of the location of the successive divisions of the Magnesian Limestone and of the interesting reef development.

The tectonic structure of the area is rather summarily treated but a clear picture may be obtained from structure contour maps of the Silkstone and Barnsley coals, of the sub-Permian surface and from a diagram showing the well-known fault-network.

Short chapters on the Pleistocene and Recent Deposits and on the economic products conclude the volume.

Paper restrictions led to some curtailment of the originally-planned memoir and it is unfortunate that the agreeable fount of type used in the Wakefield memoir has had to be replaced by a smaller fount.

H. C. V.

**British Regional Geology : East Yorkshire and Lincolnshire,** by Vernon Wilson. Pp. 94, with 34 text-figures and eight plates. H.M. Stationery Office, 2/6.

Yorkshire geologists have waited a long time for this handbook, which was not published along with the first edition of those dealing with other regions. The area dealt with includes Yorkshire east of the Vale of Mowbray and the River Ouse, and Lincolnshire east of the Trent.

Most of the region is occupied by Jurassic and Cretaceous rocks which show, along the 100 miles of their outcrop described in the handbook, such a remarkable variation in lithology and in fossil content that it is difficult to summarise their history in a few words. Dr. Wilson has, however, succeeded in presenting a wealth of detail without obscuring the broad principles which determined the formation of these rocks. He has described the Lincolnshire and Yorkshire

developments separately and has given useful diagrams summarising at a glance the regional variation. Those for Lincolnshire are particularly valuable in that they are new and represent much original investigation.

Although the area lacks tectonic structures of striking physiographic expression, it nevertheless includes such major structures as the Cleveland uplift and the Market Weighton axis. Dr. Wilson has given a balanced account of their complicated history.

Useful text-figures of common fossils will be of great help to the amateur using the handbook and the reviewer would mention especially Fig. 25 with illustrations of echinoid and crinoid plates which are of zonal value and which might so easily be overlooked. The block diagrams are not so happy and that of East Yorkshire might be difficult to recognise without the names.

The ultracritical reader might object to certain statements such as the presumed absence of Kimmeridge Clay between Market Weighton and the Humber or of *Actinocamax plenus* in the Black Band, of which there are several records.

As an up-to-date summary, informative and readable, Dr. Wilson's volume may be commended to all Yorkshire naturalists.

H. C. V.

**On Movements of the Swift (*Micropus a. apus* L.) during the Breeding Season** (Preliminary Communications), by **Jukka Koskimies** (Zoological Laboratory, Helsinki), reprinted from *Ornis Fennica*, XXIV, No. 3-4, 1947.

This paper discusses and illuminates from a fresh angle a phenomenon of Central Europe that has its counterpart in Northern England. During periods of cold weather Swifts are not infrequently absent from their nesting-sites for long periods and observed movements have at times the appearance of sustained migration, as W. S. Medlicott and others have remarked (and see *Naturalist*, January-March, 1947). When three birds turned up before dusk at Masham on August 12th, 1947, some days after the species had apparently completely departed, I questioned if they were not newcomers looking for a roosting-site.

After sifting and summarising many observations, Dr. Koskimies arrives at the conclusion that such movements in the summer months 'coincide almost without exception with the passage of cyclones characterising the general weather conditions,' to avoid which the Swifts leave the district and fly to the edge of the disturbed area, usually against the wind. Nestling Swifts, he says, are much more 'tenacious against hunger' than adults, whose expenditure of energy requires continual replenishment. Thus the flight of adults 'from the breeding localities on the approach of cyclonic conditions does not bode the destruction of the brood, but rather its salvation.' Young Swifts 'have well withstood a fast period of seven days'; adults are 'critically weakened' by a fast of 2-3 days. The form of experiment is not one that I should care to make; but the young of most passerines would not survive a single day without food; in view of which 'the ability to resist hunger peculiar to the [young] Swift must be regarded as a very remarkable specialisation of the general metabolism of this bird.'

R. C.

**Notes on the Birds of Warwickshire**, by **C. A. Norris**. Pp. 78. Cornish Brothers Ltd., 39 New Street, Birmingham, 8/6.

This book comprises brief references to county topography and lists of birds, followed by records and notes of status of the 121 regular summer and winter residents and migrants, and 116 irregular visitors and vagrants. The number of rare vagrants listed is 80, not 81 as stated, and the total of all species on the County List 237, not 238.

The author has collated the available information from members of the Birmingham and West Midlands Bird Club, of which he is Hon. Secretary, and from other sources, into a work that will be invaluable to residents in and visitors to Warwickshire, and be useful to students of comparative distribution and migration everywhere. The north-eastern spread of the Little Ringed Plover (Yorkshire, 1947 and 1948) is exemplified by the occurrence of an odd bird in a Warwickshire gravel pit in 1945. The status ascribed to the Stonechat, 'a rarity,' also fits the species in Yorkshire, but the reason stated, 'few areas of gorse and bracken-covered common,' is less applicable, and one suspects such is not the sole reason.

R. C.

**Film Strip. British Birds No. 1. The Reed Warbler.** Prepared in collaboration with the Royal Society for the Protection of Birds. Notes prepared by Philip E. Brown, F.Z.S., M.B.O.U. Photography by Ernest Mytum. Produced and marketed by Educational Publicity, Ltd., 17 Denbigh Street, London, S.W.1, 12/6.

The advantages of the film strip are now fairly well known and appreciated. There are many projectors on the market and they are finding their way into the schools. It is very enterprising of the R.S.P.B. to support the production of suitable strips of bird photographs and there is wisdom in keeping one strip for one species. This film strip weighs a quarter of an ounce (half an ounce including the container) and has 28 pictures for projection, the size of each being 24 mm. by 18 mm. The original photographs have been obviously excellent, but, as in so many cases of reduction to 35 mm. film there is a distinct falling off in the quality of the print. The tone gradation is much too steep and this tends to produce rather harsh renderings in some of the frames. The notes by Mr. Brown are quite suitable to put into the hands of a competent teacher who knows the birds, but the beginner should consult the *Handbook of British Birds* and, of course, study the bird in the field. It should be noted that in 28 frames there are two maps, a 'territory' diagram and a most complete series illustrating the activities of the Reed Warbler throughout the nesting season. If the film is revised, a useful additional frame would be one depicting a typical locality for the species.

W. R. G.

**Textbook of General Zoology**, by W. C. Curtis and M. J. Guthrie. Fourth edition. Pp. 794, with 524 figs. Chapman & Hall, 27/-.

The fact that this is the fourth edition of a book originally published twenty years ago is eloquent of its usefulness and well-deserved popularity. Although American and not designed for use in British University courses, there is much of real value to students and teachers in this country. There is a sound introduction to general physiology, embryology, heredity and evolution, as the principal zoological fields, coupled with an account of the various groups of the animal kingdom used to illustrate the lesser fields. In other words types are used to introduce general biological principles rather than as mere anatomical units. Nevertheless, this latter aspect is not neglected and examples of the majority of animal groups are considered. Teachers in schools and colleges will find much material for illustration in the teaching of biological principles even though the book as a whole is too extensive for first year work alone. It is not too advanced for the serious first year University student if he is capable of exercising discrimination. The figures are profuse, well chosen and well reproduced; they also have the pleasing feature of being reasonably self-explanatory. To use a phrase from the Preface to the first edition, this book will definitely 'stimulate the competent to the work necessary in a sustained intellectual effort and at the same time give the less competent all the help that is possible.'

H.H.

**Diseases of Crop Plants.** Report on Fungus, Bacterial and other Diseases of Crops in England and Wales for the years 1943-1946, by W. C. Moore. Pp. vi + 90, Bulletin No. 139, Ministry of Agriculture and Fisheries. H.M. Stationery Office, 2/6.

This report is the ninth of the series on plant diseases which began in 1917. It follows the same plan as the one last issued in 1943, with the addition of statistical data relating to some diseases and maps showing the distribution of certain important diseases for which information has not previously been available. The information, which includes fungus, bacterial, virus and deficiency diseases, is arranged as in the last report in sections covering potatoes, root and fodder crops, pulses, pasture and forage crops, vegetables, fruit, hop, mushroom and flax, and ornamental and miscellaneous plants. It includes records of twenty-six fungi and bacteria of plant pathological interest met with during the four-year period under review and not previously recorded in this series of reports, and new host plants for another twenty-one species. The report is illustrated by photographs and includes references to most of the literature on plant diseases published in the British Isles during the four years covered.



**In Praise of Flowers.** Reproductions of paintings by **Frank O. Salisbury**, with text by **Sir William Beach Thomas**. Pp. viii + 49, with 16 colour plates. Evans Brothers Ltd., 21/-.

When the air raids on London drove Mr. Salisbury from his Hampstead studio he found a refuge at Ivinghoe and turned to painting flowers instead of people. The sixteen beautiful paintings here selected for reproduction serve to emphasise his great talents as an artist. He captures to perfection the subtle charm and elegance of the lily, rhododendron, delphinium and lilac, the exotic beauty of magnolia and the oriental splendour of wistaria. It is appropriate that Sir William Beach Thomas should contribute the commentary on these and the no less charming studies of iris and gladiolus, tulips, roses, lupins and water-lilies, for his reputation as a writer on flowers rests not only on his knowledge but on an artistry in prose which matches the deftness of the painter's brush. The book will appeal especially to the artist and flower connoisseur. It would form an ideal gift for them, as its production is in keeping with the beauty of its contents.

**Directory of Natural History Societies**, by **H. K. Airy Shaw**. Pp. 155, Amateur Entomologists' Society, Pamphlet No. 7, 1 West Ham Lane, London, E.15. 7/6.

This useful compilation gives a comprehensive list of all existing, extinct or moribund Natural History and Scientific Societies (from the Royal to the British Snail-Watching and Guppy Breeders' Societies) with details of address, date of foundation, area covered, membership and subscription, meetings, publications issued, and amenities such as library, reference collections and microscopic and other equipment. It is arranged in sections devoted to national organisations and societies, and unions covering large areas, followed by local societies, including schools, arranged under counties and covering England, Scotland, Wales and Ireland. We notice that the secretaries of the Yorkshire Naturalists' Union and the Leeds Naturalists' Club are incorrectly given, but increased accuracy will no doubt be achieved if the subsequent editions which are envisaged are published. Dr. Julian Huxley and Mr. R. S. R. Fitter contribute a Foreword on the rôle of local Natural History Societies and Mr. B. A. Cooper makes a plea for a National Union of Naturalists. The Directory should be valuable for anyone wishing to get in touch with local naturalists or societies in any part of Britain and the compiler is to be congratulated on the completion of a work which was first projected by the Amateur Entomologists' Society nearly five years ago.

## CORRESPONDENCE

*To the Editor of 'The Naturalist.'*

SIR,

The 'Ornithological Report for Northumberland and Durham for 1947' (*The Naturalist*, 1948, 122) contains a sight record of the Kite, *Milvus milvus*, from Holy Island. After a brief plumage description, corresponding well to the principal field characters of the Kite, the note continues: 'Henderson is familiar with the Kite, having seen it when serving in the Middle East; he is thus quite sure of the correctness of his identification and is certain that it was not a Black Kite.'

This last statement, which is intended to corroborate the record, in point of fact makes it almost valueless. If Mr. Henderson has observed the 'Common' or 'Red' Kite in the Middle East, it would be interesting to know where, since the records of this bird from Middle Eastern countries are very few indeed. The Common Kite of the Middle East is *Milvus migrans aegyptius*, a race of the Black Kite; the typical race of the Black Kite also occurs there on migration. It is thus improbable that Mr. Henderson was 'familiar' with the Red Kite, and we must suppose that, if the Kite seen by him in Northumberland was the same as those seen by him in the Middle East, it was some race of Black Kite, *Milvus migrans*.

As it stands, the record is unacceptable and should be placed in brackets.

M. F. M. MEIKLEJOHN, M.B.O.U.



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